Low-Pass Filtered Current Meter Records for the West Coast of Vancouver Island: Coastal Oceanic Dynamics Experiment, 1979-81.

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1985

Canadian Data Report of Hydrography and Ocean Sciences No. 40

Canada

5-5995/

Canadian Data Report Of Hydrography and Ocean Sciences

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Generally, the reports will contain raw and/or analyzed data but will not contain interpretations of the data. Such compilations will commonly have been prepared in support of work related to the programs and interests of the Ocean Science and Surveys (OSS) sector of the Department of Fisheries and Oceans.

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En général, les rapports contiennent des données brutes ou analysées mais ne fournissent pas d'interprétations des données. Ces compilations sont préparées le plus souvent à l'appui de travaux reliés aux programmes et intérêts du service des Sciences et Levés océaniques (SLO) du ministère des Pêches et des Océans.

Les rapports statistiques sont produits à l'échelon régional mais sont numérotés et placés dans l'index à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page de titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Les établissements des Sciences et Levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports depuis décembre 1981. Vous trouverez dans l'index des publications du volume 38 du *Journal canadien des sciences halieutiques et aquatiques*, la liste de ces publications ainsi que le dernier numéro paru dans chaque catégorie. La nouvelle série a commencé avec la publication du Rapport n° 1 en janvier 1982.

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LOW-PASS FILTERED CURRENT METER RECORDS FOR THE WEST COAST OF VANCOUVER ISLAND: COASTAL OCEANIC DYNAMICS EXPERIMENT, 1979-81.

by

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Cat. No. FS - / ISSN

Correct citation for this publication:

Thomson, R.E., W.R. Crawford, H.J. Freeland and W.S. Huggett. 1985. Low-pass filtered current meter records for the west coast of Vancouver Island: Coastal Oceanic Dynamics Experiment, 1979-81. Can. Data Rep. Hydrogr. Ocean Sci. 40: 102 p.

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ABSTRACT

Thomson, R.E., W.R. Crawford, H.J. Freeland and W.S. Huggett. 1985. Low-pass filtered current meter records for the west coast of Vancouver Island: Coastal Oceanic Dynamics Experiment, 1979-81. Can. Data Rep. Hydrogr. Ocean Sci. 40: 102 p.

Appendix A of this report presents plots of low-pass filtered versions of the coastal winds and 'merged' temperature, salinity and velocity records obtained from moored current meters off the west coast of Vancouver Island during the Canadian Coastal Oceanic Dynamics Experiment (CODE), May 1979 to September 1981. Only merged current meter records spanning two or more deployment periods (typically longer than six months) are included. Appendix B of the report contains band-averaged spectra of the across (u) and alongshore (v) components of the low frequency wind and current vectors.

Data have been processed using an eighth-order, low-pass Butterworth filter with half-power point at a cutoff frequency of $(40 \text{ hours})^{-1}$. This filter removes contributions from the major tidal constituents and essentially eliminates fluctuations with periods shorter than two days. Principal axes analysis has been used to define the across- and alongshore components of velocity for each wind and current meter record. Spectra are presented in the standard format of log spectral density versus log frequency and in the energy-preserving format of spectral density x frequency versus log frequency.

key words: Vancouver Island; CODE; physical oceanography; circulation.

RÉSUMÉ

L'annexe A du rapport présente des tracés de versions filtrées en passe-bas de vents côtiers et de relevés "fusionnés" de température, de salinité et de vitesse obtenus à partir de courantomètres amarrés au large de la côte ouest de l'île de Vancouver au cours de l'expérience canadienne de dynamique océanique littorale (CODE), de mai 1979 à septembre 1981. On ne trouve ici que les relevés fusionnés de courantomètre s'étendant sur deux périodes de déploiement et plus (chacune d'une durée généralement supérieure à six mois). L'annnexe B du rapport renferme des spectres moyens de la bande des composantes transversales (u) et littorales (v) des vecteurs de vent et de courant à basse fréquence.

Les données ont été traitées au moyen d'un filtre Butterworth passe-bas de huitième ordre avec point de demi-puissance à une fréquence de coupure de $(40 \text{ heures})^{-1}$. Ce filtre enlève des apports des principaux composants tidaux et élimine essentiellement les fluctuations dont les périodes sont inférieures à deux jours. L'analyse des axes principaux a été employée pour déterminer les composantes transversales et littorales de vitesse pour chacun des relevés de vent et de courantomètre. Les spectres sont présentés dans la forme normalisée du log de la densité spectrale en fonction du log de la fréquence et dans la forme qui permet de conserver l'énergie, soit la densité spectrale x la fréquence en fonction du log de la fréquence.

Mots-clés: île de Vancouver, CODE, oceanographie physique, circulation.

ACKNOWLEDGEMENTS

A number of individuals contributed to the collection and processing of these data. We thank Joseph Linguanti, Dennis Francis, Allan Douglas, Keith Lee and Andrew Lee for assistance in processing the data. Thanks also to Cor de Jong, Bernard Minkley, Fred Hermiston, Mike Woodward, John Love, Al Stickland, Reg Bigham, Les Spearing, John Meikle, Fred Stephenson, Bruce Canning and Liliane Wu for their contribution to the data collection. We gratefully acknowledge the appreciable contribution of the officers and crew of the C.S.S. Parizeau, C.F.A.V. Endeavour, Pandora II and C.S.S. Vector to the success of the research project. Lastly, we thank Trish Kimber for organizing the diagrams, Billie Mathias for typing the manuscript and Dr. Larry Giovando for reviewing the text.

INTRODUCTION

The CODE program was an interdisciplinary investigation of the circulation, water property variability and plankton distributions off the west coast of Vancouver Island. Moored arrays of current meters, pressure gauges and wind stations formed the core of the physical program (Figure 1). The spatial structure of the temperature, salinity, density and dissolved oxygen fields in the region of the moored arrays were obtained during numerous quasi-synoptic ship surveys. Much of the information collected during CODE has been presented in a variety of manuscripts and scientific papers (see References). The water property data are published in companion volumes in this series (Thomson, et al, 1984).

The purpose of this report is to make available data on the low frequency variability of coastal winds and currents over the shelf-slope region of Vancouver Island for the period May 1979 to September 1981. To this end, we have limited the analysis to those locations and depths for which there were two or more separate instrument deployments spanning a duration in excess of four months. Records having large gaps or based on short deployments are not included. The method used to 'merge' the files for individual deployment periods is described in the following sections. Further details on current meter records can be found in the references. Of particular relevance is a report by Freeland (1983) which covers the low frequency current records for southern Vancouver Island for the CODE period.

Organization of the report is as follows. The remainder of the text describes the data preparation and analysis. Appendix A contains the low-pass filtered temperature, salinity, current and wind data. Vectors are presented in both component and vector form with the alongshore and cross-shore directions determined via principal axes analysis. Appendix B contains spectra of the wind and current components.

OBSERVATIONS

The current meter data described in this report cover moorings seaward of Brooks Peninsula, Estevan Point and Carmanah Point (Figure 1). A typical mooring consisted of Aanderaa RCM4/5 current meters suspended beneath subsurface flotation at depths of 40 to 50 m. On the continental shelf, current meters were at nominal depths of 50 and 100 m; on the continental slope meters were at 50 m and varying depths depending on location. In summer, additional subsurface moorings with instruments at 15 to 25 m were deployed at E0, E1, E2 and B1. Further details concerning the moorings can be found in Freeland (1983) and in Crawford and Thomson (1983, 1984).

With few exceptions, current meters deployed during CODE measured temperature and conductivity in addition to current speed and direction (Table 1). Moreover, at least one current meter per mooring line was usually instrumented with a pressure sensor for determination of mooring depression. Instruments deeper than the climatic mean upper layer (i.e. deeper than 100 m) typically had expanded temperature and conductivity ranges to ensure enhanced resolution. As a rough approximation, temperatures and salinity are accurate to $\pm$ 0.05C° and $\pm$ 0.03 ppt*, respectively. Use of expanded sensor ranges increases the resolutions to about $\pm$ 0.01C° and $\pm$ 0.01 ppt. The threshold speed for Aanderaa RCM current meters is 2.0 cm/s and speeds are

*ppt = parts per thousand

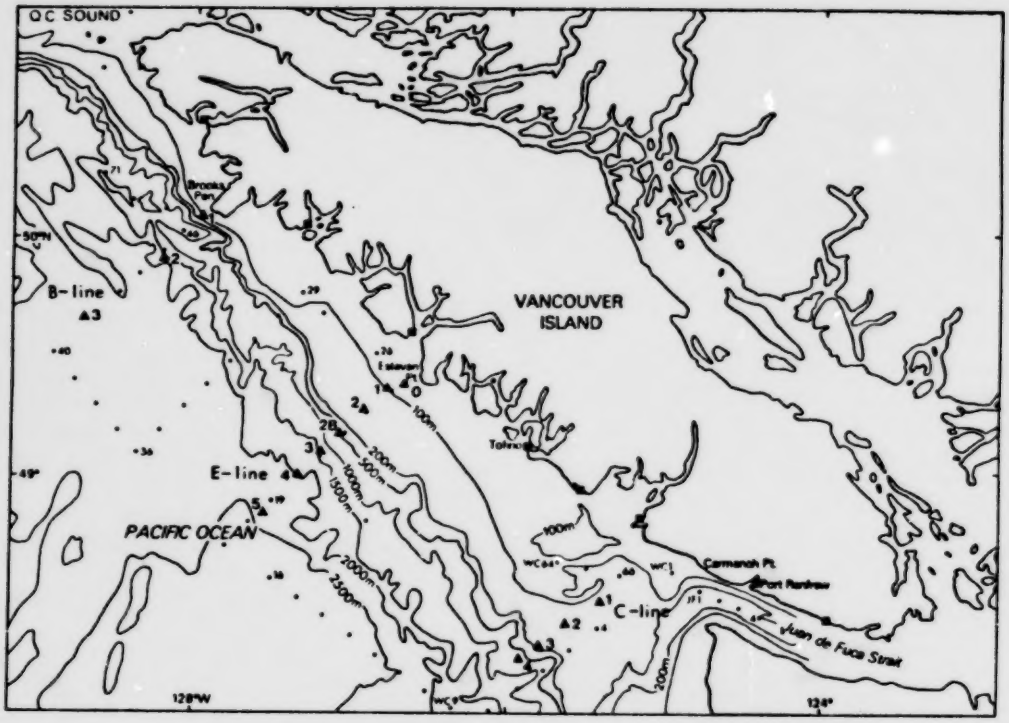


Figure 1. Locations of current meters (triangles), pressure gauges (squares) and CTD stations (dots) for Coastal Oceanic Dynamics Experiment.

accurate to ± 1 cm/s or 2% of actual speed, whichever is greater. Directions are accurate to ± 5° for speeds in the range of 5 to 100 cm/s.

A typical mooring period lasted approximately four months. At the end of each period, meters were recovered, serviced (or replaced) and redeployed. Turn-around times were generally less than two days, depending on weather conditions and state of the mooring. An attempt was made to redeploy instruments in the same configuration. However, no winter moorings were maintained near the coast or near the surface due to extreme wave conditions. Anemometer buoys were deployed in the summer only (May to September). As a consequence, the winds used in this report are based on six-hourly surface winds derived from the 3°x3° spatial grid of sea surface pressure (Bakun, 1973; Thomson, 1983). Pressure-derived winds for the grid point 49°00'N, 127°00'W were provided by Andrew Bakun (pers. comm.).

A summary of information pertinent to each current meter record used in the low frequency analysis is presented in Table 1. 'Deployment period' refers to the start/end time of true oceanic data measurement.

GENERATION OF HOURLY DATA

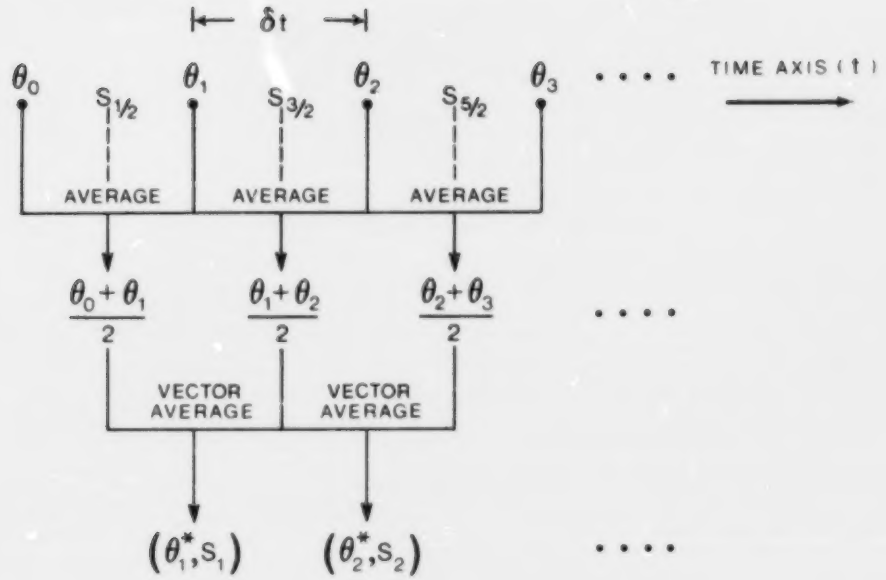
All current meter records have been trimmed to eliminate poor quality and non-oceanic portions of the observations, checked for possible timing errors, and then edited for obvious 'spikes'. Calibrated Aanderaa records consist of instantaneous values of temperature, salinity and direction together with average speeds over sampling intervals of 15, 30 or 60 minutes.

Prior to analysis, data at sampling intervals shorter than 60 minutes have been averaged to hourly values using running mean filters (e.g. Godin, 1972). The first step, in the case of the velocity measurements, is to average successive directions to produce an average direction centered midway through each interval (Figure 2). Successive speeds and mean directions are then averaged to generate a "direction averaged" velocity record beginning at time t(start) + δt, where δt is the sampling interval. Temperature, salinity and direction averaged velocity records with sampling intervals of 30 minutes are subjected to a 2x2x3 running mean filter (Figure 3) in which pairs of successive values in the original time series A are first averaged to form a new time series B. Successive pairs of values in time series B are subsequently averaged to form series C which is then averaged using three consecutive values to form the hourly data series D. The resulting hourly time series is shorter by $2\delta t$ at either end and the first value starts at time t(start) + $2\delta t$. A 4x4x5 running mean filter is applied to 15-minute data to produce hourly data.

In preparation for the next step, the current records are converted to north-south and east-west components.

DATA INTERPOLATION

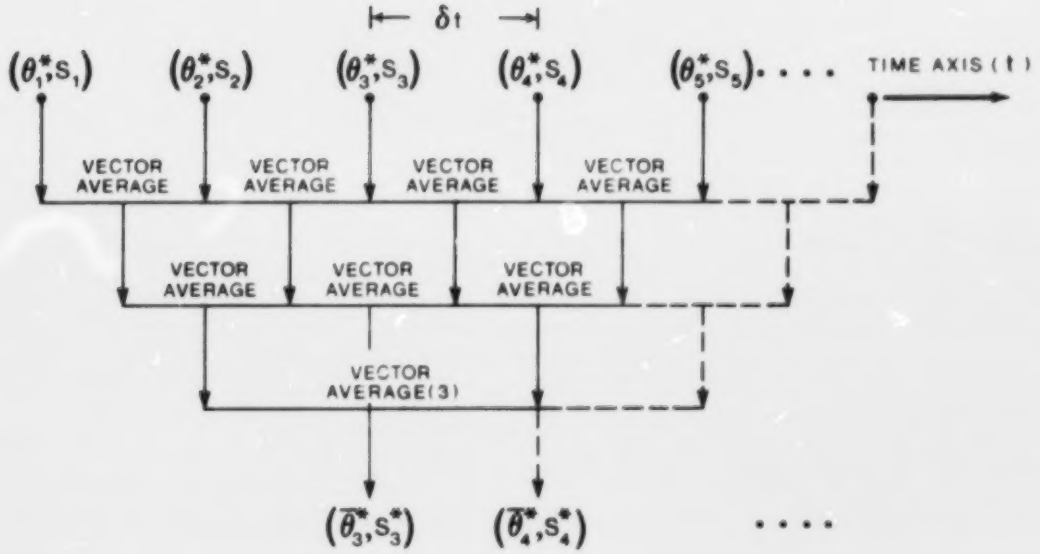
To prevent 'ringing' and loss of data upon application of the low-pass filter, record gaps due to mooring recovery and redeployment operations have been filled in using a harmonics analysis program. The procedure is to calculate the harmonic constituents for the entire merged hourly record (including gaps) using the tidal analysis package of the Institute of Ocean



Where:

(θ_1^*, S_1), (θ_2^*, S_2), etc. are obtained by separately averaging the north-south and east-west components (i.e. vector-averaging).

Figure 2. Direction-averaging procedure for Aanderaa current meter records. θ = instantaneous direction at sampling intervals δt; S = average speed over sampling interval.



Where:

$(\overline{\theta}_3^*, S_3^*)$, $(\overline{\theta}_4^*, S_4^*)$, etc. are obtained by separately averaging the north-south and east-west components.

Figure 3. Vector-averaging filter 2x2x3 for direction-averaged Aanderaa current meter records. θ^* = average direction; S = average speed.

Sciences. The constituents are then used to generate hourly 'predicted' values for the record gaps. Any low frequency signal within the breaks in the merged records is then due only to the longer period tidal fluctuations. (The tidal analysis package automatically compensates for constituent amplitude reduction caused by pre-processing with the direction-averaging filter and the 2x2x3 or 4x4x5 filters.)

LOW PASS FILTERED DATA

The low frequency wind and current meter records have been obtained through application of an eighth-order Butterworth filter with a $(40 \text{ hour})^{-1}$ cutoff frequency (half-power point). This particular squared filter produces zero phase shift, has sharp attenuation at the cutoff frequency and avoids the problems associated with Gibbs phenomena except at the start and end of a given record (Thomson and Chow, 1980). Output from the filter consists of hourly current meter data and six-hourly wind velocity components.

PRINCIPAL AXES DETERMINATION

Owing to the proximity of the coast and the northwesterly alignment of the bottom contours, it is advantageous to rotate the components of the wind and current vectors to an alongshore and cross-shore component system. These directions can be defined in terms of: (a) the mean orientation of the coastline; (b) the local orientation of the bottom contours at the mooring site; or (c) the principal axis corresponding to the orientation of the axis of maximum signal variance. The present analysis uses the last method and is based on a computational procedure outlined in Freeland et al (1975). Each record then has a corresponding rotation angle 'theta' which measures the alignment of the positive principal (alongshore) axis anticlockwise from true north (0°). The value of theta in degrees is listed with each plot in Appendix A. Note that winds follow oceanographic convention; i.e. plotted in the direction towards which the wind blows.

SPECTRAL ANALYSIS

Spectra of the across-shore (u) and alongshore (v) components of wind and current are presented in Appendix B. The left-hand panels show the u,v spectra as log spectral density versus log frequency while the right-hand panels show spectra as spectral density x frequency versus log frequency. In the latter case, the area under the spectral curve over a specified frequency range is equal to the total signal variance over that band of frequencies (energy preserving spectra).

To accommodate the spectral programs, the current data have been decimated to 2-hourly or 4-hourly records, yielding respective Nyquist frequencies of 0.250 cph* and 0.125 cph. The corresponding number of bands in the analysis are 500 and 250 so that the bandwidth in all cases is 0.005 cph. Similarly, for the wind data we have used 166 bands to achieve a bandwidth of 0.005 cph. A typical record is longer than 10 months ($\sim$ 7,200 values) so that there are generally in excess of 3.5 Fourier components per frequency band. This translates roughly to 7 degrees of freedom per band depending on the dominant scale of motion. Since the data have been low pass filtered, spectra are plotted only to a period of around two days corresponding to the filter cutoff.

*cph = cyles per hour

Table 1. Characteristics of individual current meter records used to comprise the merged current meter files. 'Period' gives start and end time of a given record; Aa = Aanderaa; RCM4/5; G = Geodyne 850; NB = Neil Brown.

			DEPLOYMENT CHARACTERISTICS			PARAMETERS			
-Mooring- Depth (m)	Latitude Longitude	No.	Period Day/Month/Year	Type	Sampling Interval (min)	u,v	T	C	P
E01 55	49° 20.5'N 126° 47.5'W	1	07/05/79 10/10/79	Aa	30	x	x	x	x
E01 46	49° 21.1'N 126° 45.4'W	2	22/09/79 17/11/79	Aa	30	x	x	x	x
E01 45	49° 20.7'N 126° 45.3'W	3	23/01/80 02/05/80	Aa	30	x	x	x	x
E01 45	49° 21.0'N 126° 45.6'W	4	07/05/80 13/09/80	Aa	30	x	x	x	x
E01 89	49° 20.5'N 126° 47.5'W	1	07/05/79 10/10/79	Aa	30	x	x	x	
E01 85	49° 21.1'N 126° 45.4'W	2	22/09/79 17/01/80	Aa	30	x	x	x	
E01 84	49° 20.7'N 126° 45.3'W	3	23/01/80 02/05/80	Aa	30	x	x	x	
E01 89	49° 21.0'N 126° 45.6'W	4	07/05/80 13/09/80	Aa	30	x	x	x	
E02 50	49° 16.0'N 126° 54.0'W	1	08/05/79 25/07/79	G	30	x			
E02 49	49° 16.2'N 126° 52.4'W	2	15/09/79 19/11/79	G	30	x			
E02 49	49° 16.3'N 126° 51.9'W	3	23/01/80 25/04/80	Aa	30	x	x	x	
E02 45	49° 16.2'N 126° 52.7'W	4	07/05/80 15/09/80	Aa	30	x	x	x	x
E02 100	49° 15.6'N 126° 54.0'W	1	07/05/79 13/09/79	Aa	30	x	x	x	
E02 122	49° 16.3'N 126° 52.4'W	2	15/09/79 17/01/80	Aa	30	x	x	x	

Table 1 (continued)

-Mooring- Depth (m)	Latitude Longitude	No.	DEPLOYMENT CHARACTERISTICS Period Day/Month/Year	Type	Sampling Interval (min)	PARAMETERS u,v	T	C	P
E02 118	49° 16.3'N 126° 51.9'W	3	23/01/80 02/05/80	Aa	30	x	x	x	
E02 116	49° 16.2'N 126° 52.7'W	4	07/05/80 15/09/80	Aa	30	x	x	x	
E03 315	49° 06.0'N 127° 08.7'W	1	08/05/79 12/09/79	Aa	30	x	x	x	x
E03 375	49° 06.1'W 127° 08.2'W	2	15/09/79 18/01/80	Aa	30	x	x		
E03 358	49° 06.1'N 127° 08.2'W	3	22/01/80 02/05/80	Aa	30	x	x	x	
E03 350	49° 06.4'N 127° 08.6'W	4	07/05/80 03/08/80	G	30	x			
E03 575	49° 06.1'N 127° 08.2'W	1	15/09/79 18/01/80	Aa	30	x	x	x	
E03 558	49° 06.1'N 127° 08.2'W	2	22/01/80 02/05/80	Aa	30	x	x	x	
E03 555	49° 06.4'N 127° 08.6'W	3	07/05/80 12/09/80	Aa	30	x	x	x	
E03 775	49° 06.1'N 127° 08.2'W	1	15/09/79 18/01/80	Aa	30	x	x	x	
E03 755	49° 06.1'N 127° 08.2'W	2	22/01/80 02/05/80	Aa	30	x	x	x	
E03 750	49° 06.4'N 127° 08.6'W	3	07/05/80 12/09/80	Aa	30	x	x	x	
E04 335	48° 58.0'N 127° 18.3'W	1	08/05/79 21/09/79	Aa	30	x	x	x	x
E04 370	48° 57.7'N 127° 19.7'W	2	22/09/79 18/01/80	Aa	30	x	x	x	x
E04 378	48° 57.5'N 127° 20.2'W	3	22/01/80 02/05/80	Aa	30	x	x	x	x

Table 1. (continued)

-Mooring- Depth (m)	Latitude Longitude	No.	DEPLOYMENT CHARACTERISTICS Period Day/Month/Year	Type	Sampling Interval (min)	PARAMETERS u,v	T	C	P
E04 350	48° 58.2'N 127° 19.7'W	4	08/05/80 12/09/80	Aa	30	x	x	x	x
E04 535	48° 58.0'N 127° 18.3'W	1	08/05/79 21/09/79	Aa	30	x	x	x	
E04 570	48° 57.7'N 127° 19.7'W	2	22/09/79 18/01/80	Aa	30	x	x	x	
E04 578	48° 57.5'N 127° 20.2'W	3	22/01/80 12/03/80	Aa	30	x	x	x	
E04 735	48° 58.0'N 127° 18.3'W	1	08/05/79 21/09/79	Aa	30	x	x	x	
E04 770	48° 57.7'N 127° 19.7'W	2	22/09/79 18/01/80	Aa	30	x	x	x	
E04 778	48° 57.5'N 127° 20.2'W	3	22/01/80 22/02/80	Aa	30	x	x	x	
E04 1020	48° 57.7'N 127° 19.7'W	1	23/09/79 18/01/80	Aa	30	x	x	x	
E04 1028	48° 57.5'N 127° 20.2'W	2	22/01/80 02/05/80	Aa	30	x	x	x	
E04 1000	48° 58.2'N 127° 19.7'W	3	08/05/80 12/09/80	Aa	30	x	x	x	
E04 1235	48° 58.0'N 127° 18.3'W	1	08/05/79 21/09/79	Aa	30	x	x	x	
E04 1270	48° 57.7'N 127° 19.7'W	2	22/09/79 18/01/80	Aa	30	x	x	x	
E04 1278	48° 57.5'W 127° 20.2'W	3	22/01/80 02/05/80	Aa	30	x	x	x	
E04 1250	48° 58.2'N 127° 19.7'W	4	08/05/80 12/09/80	Aa	30	x	x	x	
E05 64	48° 47.7'W 127° 35.1'W	1	16/09/79 18/01/80	Aa	30	x	x		x

Table 1. (continued)

-Mooring- Depth (m)	Latitude Longitude	No.	DEPLOYMENT CHARACTERISTICS Period Day/Month/Year	Type	Sampling Interval (min)	PARAMETERS u,v	T	C	P
E05 63	48° 46.6'N 127° 35.6'W	2	22/01/80 02/05/80	Aa	30	x	x		x
E05 55	48° 46.9'N 127° 35.5'W	3	08/05/80 12/09/80	Aa	30	x	x		x
E05 450	48° 48.1'N 127° 35.3'W	1	09/05/79 11/09/79	Aa	30	x	x	x	x
E05 513	48° 47.7'N 127° 35.1'W	2	16/09/79 12/01/80	G	30	x			
E05 510	48° 48.1'N 127° 35.6'N	3	22/01/80 19/03/80	G	30	x			
E05 950	48° 48.1'N 127° 35.3'W	1	09/05/79 03/09/79	Aa	30	x	x	x	
E05 1010	48° 47.7'N 127° 35.1'W	2	16/09/79 18/01/80	Aa	30	x	x	x	
E05 1010	48° 46.6'N 127° 35.6'W	3	22/01/80 02/05/80	Aa	30	x	x	x	
E05 1000	48° 46.9'N 127° 35.5'W	4	08/05/80 12/09/80	Aa	30	x	x	x	
E05 1510	48° 47.7'N 127° 35.1'W	1	16/04/79 18/01/80	Aa	30	x	x		
E05 1510	48° 46.6'N 127° 35.6'W	2	22/01/80 02/05/80	Aa	30	x	x		
E05 1500	48° 46.9'N 127° 35.5'W	3	08/05/80 12/09/80	Aa	30	x	x		
B01 53	50° 05.5'N 127° 58.6'W	1	18/04/79 04/05/80	Aa	60	x	x		
B01 50	50° 05.1'N 127° 58.4'W	2	11/05/80 09/09/80	Aa	30	x	x		
B01 113	50° 05.4'N 127° 58.6'W	1	11/05/79 17/09/79	Aa	30	x	x	x	

Table 1. (continued)

		DEPLOYMENT CHARACTERISTICS				PARAMETERS			
-Mooring- Depth (m)	Latitude Longitude	No.	Period Day/Month/Year	Type	Sampling Interval (min)	u,v	T	C	P
B01 111	50° 05.5'N 127° 58.6'W	2	18/09/79 09/05/80	Aa	60	x	x	x	
B01 106	50° 05.1'N 127° 58.4'W	3	11/05/80 09/09/80	Aa	30	x	x	x	
B02 475	49° 55.8'N 128° 17.9'W	1	23/09/79 09/05/80	Aa	60	x	x	x	
B02 488	49° 55.9'N 128° 17.0'W	2	11/05/80 09/09/80	Aa	30	x	x	x	
B2D 740	49° 56.3'N 128° 14.2'W	1	11/05/79 16/09/79	Aa	30	x	x	x	
B02 975	49° 55.8'N 128° 17.9'W	2	23/09/79 09/05/80	Aa	60	x	x	x	
B02 988	49° 55.9'N 128° 17.0'W	3	11/05/80 04/09/80	Aa	30	x	x	x	
B2D 1240	49° 56.3'N 128° 14.2'W	1	11/05/79 16/09/79	Aa	30	x	x	x	
B03 465	49° 38.0'N 128° 41.6'W	1	11/05/79 16/09/79	Aa	30	x	x	x	
B03 525	49° 38.6'N 128° 41.7'W	2	23/09/79 09/05/80	Aa	60	x	x	x	
B03 500	49° 38.5'N 128° 42.3'W	3	12/05/80 04/12/80	Aa	30	x	x	x	x
B03 965	49° 38.0'N 128° 41.6'W	1	11/05/79 16/09/79	Aa	30	x	x	x	
B03 1025	49° 38.6'N 128° 41.7'W	2	23/09/79 09/05/80	Aa	60	x	x	x	
CZ1 50	48° 28.1'N 125° 22.7'W	1	18/05/79 17/09/79	Aa	30	x	x	x	x
CZ1 50	48° 28.1'N 125° 22.0'W	2	27/11/79 22/04/80	Aa	30	x	x	x	x

Table 1. (continued)

-Mooring- Depth (m)	Latitude Longitude	No.	DEPLOYMENT CHARACTERISTICS Period Day/Month/Year	Type	Sampling Interval (min)	PARAMETERS u,v	T	C	P
CZ1 50	48° 28.1'N 125° 22.7'W	3	22/04/80 26/07/80	Aa	30	x	x	x	x
CZ1 50	48° 29.0'N 125° 22.1'W	4	22/10/80 07/02/81	Aa	30	x	x	x	x
CZ1 50	48° 29.0'N 125° 22.1'W	5	08/02/81 03/06/81	Aa	30	x	x	x	x
CZ1 100	48° 28.1'N 125° 22.7'W	1	18/05/79 26/09/79	Aa	30	x	x	x	
CZ1 100	48° 28.1'N 125° 22.0'W	2	27/11/79 22/04/80	Aa	30	x	x	x	
CZ1 100	48° 28.1'N 125° 22.7'W	3	22/04/80 26/07/80	Aa	30	x	x	x	
CZ1 100	48° 29.0'N 125° 22.1'W	4	22/10/80 07/02/81	Aa	30	x	x	x	x
CZ1 100	48° 29.0'N 125° 22.1'W	5	08/02/81 03/06/81	Aa	30	x	x	x	x
CZ2 50	48° 21.1'N 125° 35.0'W	1	27/11/79 05/02/80	Aa	30	x	x	x	x
CZ2 50	48° 21.1'N 125° 35.0'W	2	08/02/80 26/07/80	Aa	60	x	x	x	x
CZ2 50	48° 22.0'N 125° 34.0'W	3	22/10/80 07/02/81	Aa	30	x	x	x	x
CZ2 50	48° 22.0'N 125° 34.1'W	4	08/02/81 04/06/81	Aa	30	x	x	x	x
CZ2 100	48° 22.0'N 125° 35.0'W	1	18/05/79 10/10/79	Aa	30	x	x	x	
CZ2 100	48° 21.1'N 125° 35.0'W	2	27/11/79 05/02/80	Aa	30	x	x	x	

Table 1. (continued)

-Mooring- Depth (m)	Latitude Longitude	No.	DEPLOYMENT CHARACTERISTICS Period Day/Month/Year	Type	Sampling Interval (min)	PARAMETERS u,v	T	C	P
CZ2 100	48° 21.1'N 125° 35.0'W	3	08/02/80 26/07/80	Aa	60	x	x	x	
CZ2 100	48° 22.0'N 125° 34.0'W	4	22/10/80 07/02/81	Aa	30	x	x	x	x
CZ2 100	48° 22.0'N 125° 34.1'W	5	08/02/81 04/06/81	Aa	30	x	x	x	x
CZ3 50	48° 15.7'N 125° 46.0'W	1	19/05/79 03/10/79	Aa	30	x	x	x	x
CZ3 50	48° 15.7'N 125° 46.0'W	2	10/11/79 05/02/80	Aa	30	x	x	x	x
CZ3 50	48° 15.6'N 125° 46.5'W	3	07/02/80 15/05/80	Aa	60	x	x	x	x
CZ3 50	48° 19.0'N 125° 53.0'W	4	11/06/80 04/09/80	Aa	30	x	x	x	x
CZ3 50	48° 19.0'N 125° 52.0'W	5	22/09/80 04/02/81	Aa	60	x	x	x	x
CZ3 50	48° 15.7'N 125° 45.1'W	6	07/02/81 04/06/81	Aa	30	x	x	x	
CZ3 100	48° 15.7'N 125° 46.0'W	1	19/05/79 03/10/79	Aa	30	x	x	x	x
CZ3 100	48° 15.7'N 125° 46.0'W	2	11/10/79 05/02/80	Aa	30	x	x	x	x
CZ3 100	48° 15.7'N 125° 45.5'W	3	07/02/80 15/05/80	Aa	60	x	x	x	
CZ3 100	48° 19.0'N 125° 53.0'W	4	11/06/80 19/09/80	Aa	30	x	x	x	x
CZ3 100	48° 19.0'N 125° 52.0'W	5	22/09/80 04/02/81	Aa	60	x	x	x	x
CZ3 100	48° 15.7'N 125° 45.1'W	6	07/02/81 04/06/81	Aa	30	x	x	x	x

Table 1. (continued)

			DEPLOYMENT CHARACTERISTICS			PARAMETERS			
-Mooring- Depth (m)	Latitude Longitude	No.	Period Day/Month/Year	Type	Sampling Interval (min)	u,v	T	C	P
CZ3 200	48° 19.0'N 125° 53.0'W	1	11/06/80 19/09/80	Aa	30	x	x	x	x
CZ3 200	48° 19.0'N 125° 52.0'W	2	22/09/80 04/02/81	Aa	60	x	x	x	x
CZ3 200	48° 15.7'N 125° 45.1'W	3	07/02/81 04/06/81	NB	30	x	x		x
CZ4 70	48° 11.3'N 125° 55.2'W	1	19/05/79 02/07/79	Aa	30	x	x	x	x
CZ4 50	48° 11.4'N 125° 55.0'W	2	10/10/79 05/02/80	Aa	30	x	x	x	x
CZ4 50	48° 11.1'N 125° 55.0'W	3	27/02/80 11/06/80	Aa	60	x	x	x	x
CZ4 50	48° 11.1'N 125° 55.0'W	4	11/06/80 19/09/80	Aa	30	x	x	x	x
CZ4 50	48° 11.1'N 125° 54.1'W	5	19/09/80 04/02/81	Aa	60	x	x	x	x
CZ4 50	48° 11.1'N 125° 55.0'W	6	04/02/81 04/06/81	Aa	30	x	x	x	x
CZ4 120	48° 11.3'N 125° 55.2'W	1	19/05/79 03/10/79	Aa	30	x	x	x	x
CZ4 100	48° 11.4'N 125° 55.0'W	2	10/10/79 05/02/80	Aa	30	x	x	x	x
CZ4 100	48° 11.1'N 125° 55.0'W	3	07/02/80 11/06/80	Aa	60	x	x	x	x
CZ4 100	48° 11.1'N 125° 55.0'W	4	11/06/80 19/09/80	Aa	30	x	x	x	x
CZ4 100	48° 11.1'N 125° 54.1'W	5	19/09/80 04/02/81	Aa	60	x	x	x	x
CZ4 100	48° 11.1'N 125° 55.0'W	6	04/02/81 04/06/81	Aa	30	x	x	x	x

Table 1. (continued)

-Mooring- Depth (m)	Latitude Longitude	No.	DEPLOYMENT CHARACTERISTICS Period Day/Month/Year	Type	Sampling Interval (min)	PARAMETERS u,v	T	C	P
CZ4 270	48° 11.3'N 125° 55.2'W	1	19/05/79 03/10/79	Aa	30	x	x	x	x
CZ4 250	48° 11.4'N 125° 55.0'W	2	10/10/79 05/02/80	Aa	30	x	x	x	x
CZ4 250	48° 11.1'N 125° 55.0'W	3	07/02/80 11/06/80	Aa	60	x	x	x	x
CZ4 250	48° 11.1'N 125° 55.0'W	4	11/06/80 19/09/80	Aa	30	x	x	x	x
CZ4 250	48° 11.1'N 125° 54.1'W	5	19/09/80 04/02/81	Aa	60	x	x	x	
CZ4 250	48° 11.1'W 125° 55.0'W	6	04/02/81 04/06/81	Aa	30	x	x	x	
CZ4 500	48° 11.4'N 125° 55.0'W	1	10/10/79 31/01/80	Aa	30	x	x	x	x
CZ4 500	48° 11.1'N 125° 55.0'W	2	07/02/80 11/06/80	Aa	60	x	x	x	
CZ4 500	48° 11.1'N 125° 55.0'W	3	11/06/80 19/08/80	Aa	30	x	x	x	
CZ4 500	48° 11.1'N 125° 54.1'W	4	19/01/80 01/02/81	Aa	60	x	x	x	
CZ4 500	48° 11.1'N 125° 55.0'W	5	04/02/81 04/06/81	Aa	30	x	x	x	

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Appendix A

This section contains plots of the low-pass filtered wind and current meter time series. The time scale along the bottom of each plot gives the sequential day number starting with January 1, 1979 = day #1. Tick marks are every 50 days. Actual months are given by tick marks beneath each separate curve.

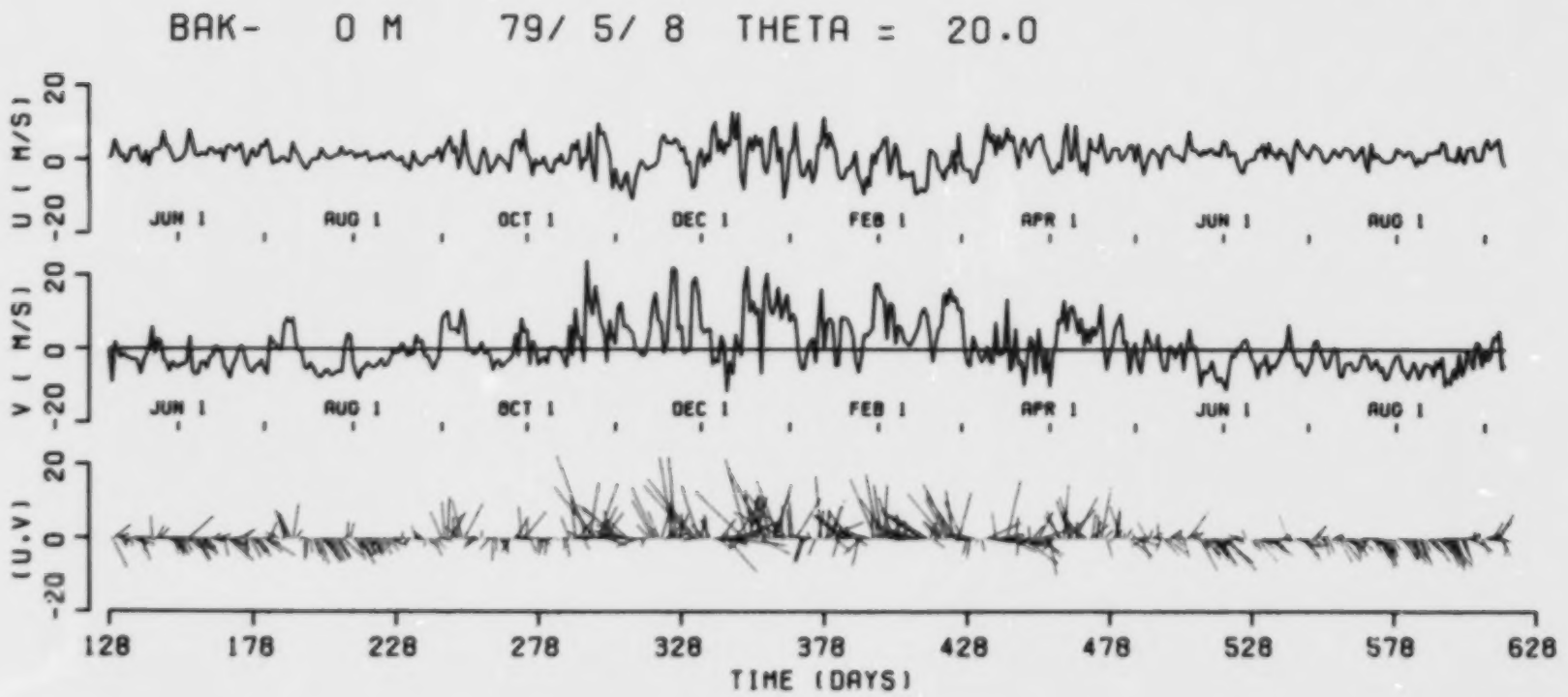
The 'Header' for each plot begins with the mooring name: Bak - Bakun pressure-derived winds at 49° 00'N, 127°00'W; CZ1, CZ2, CZ3, CZ4 are moorings off Carmanah Point; E01, E02, E03, E04, E05 are moorings off Estevan Point; B01, B02, B2D, B03, B04 are moorings off Brooks Peninsula. The location name is followed by the nominal depth of the instrument in metres. The rest of the header gives Year/Month/Day that the record starts, followed by the orientation in degrees counter-clockwise from true North for the principal axes.

Wind plots are presented for two separate durations. The shorter series spans the same period as the Brooks and Estevan moorings. The series give the across- (u) and alongshore (v) components of the wind followed by daily stick vectors (at 00:00 GMT) whose speed is determined by the scale on the left in m/s. Direction is direction towards which wind blows. Where available, current meter records contain plots of salinity (ppt)*, temperature (°C), across- (u) and alongshore (v) velocity components, and daily stick vectors of velocity (u,v). Speeds are in cm/s. Records that had large gaps (> 7 days) are denoted by an asterisk. Note that the scale bounds and ranges may vary between plots.

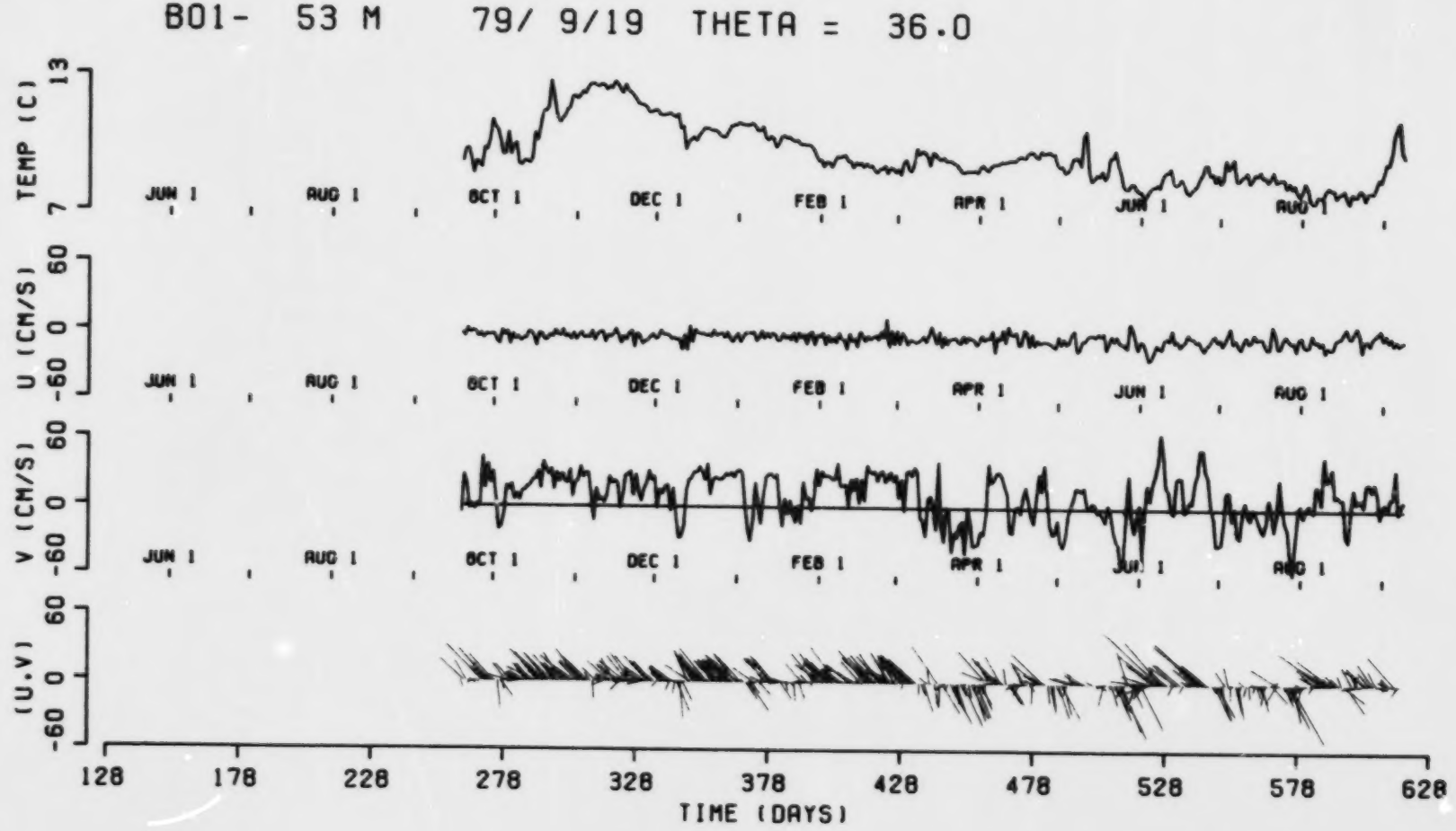
*ppt = parts per thousand

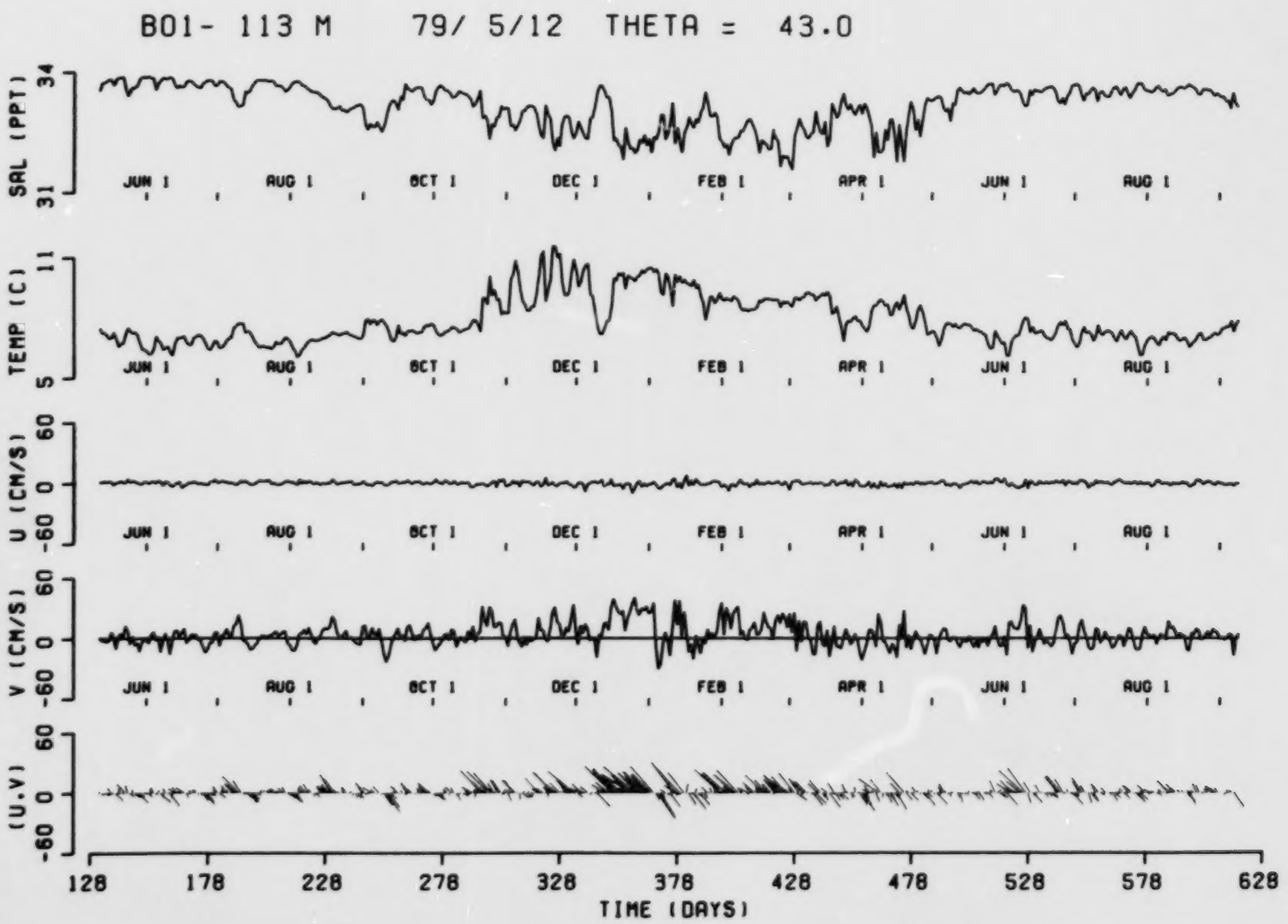
WIND DATA

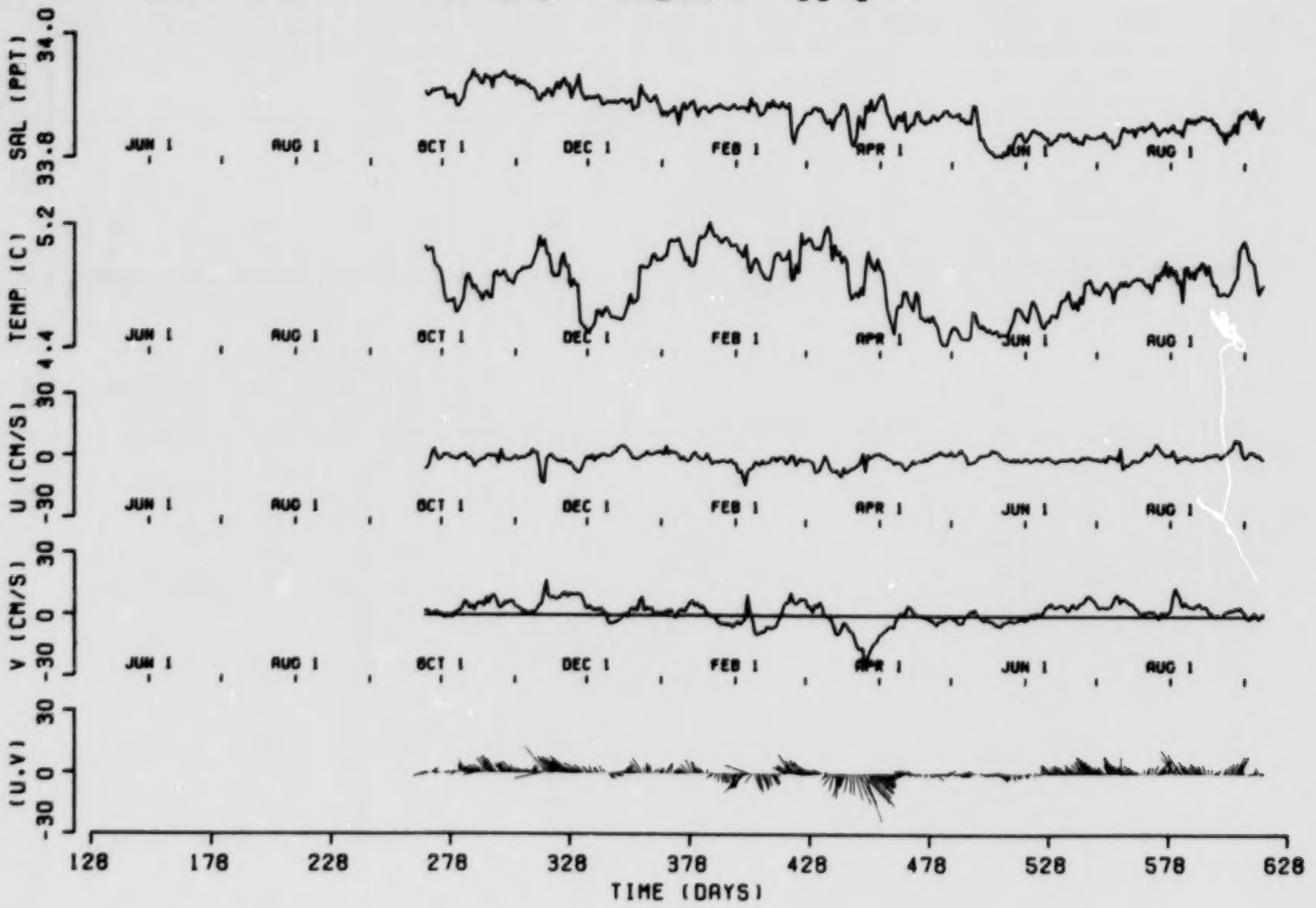
(49°00'N, 127°00'W)

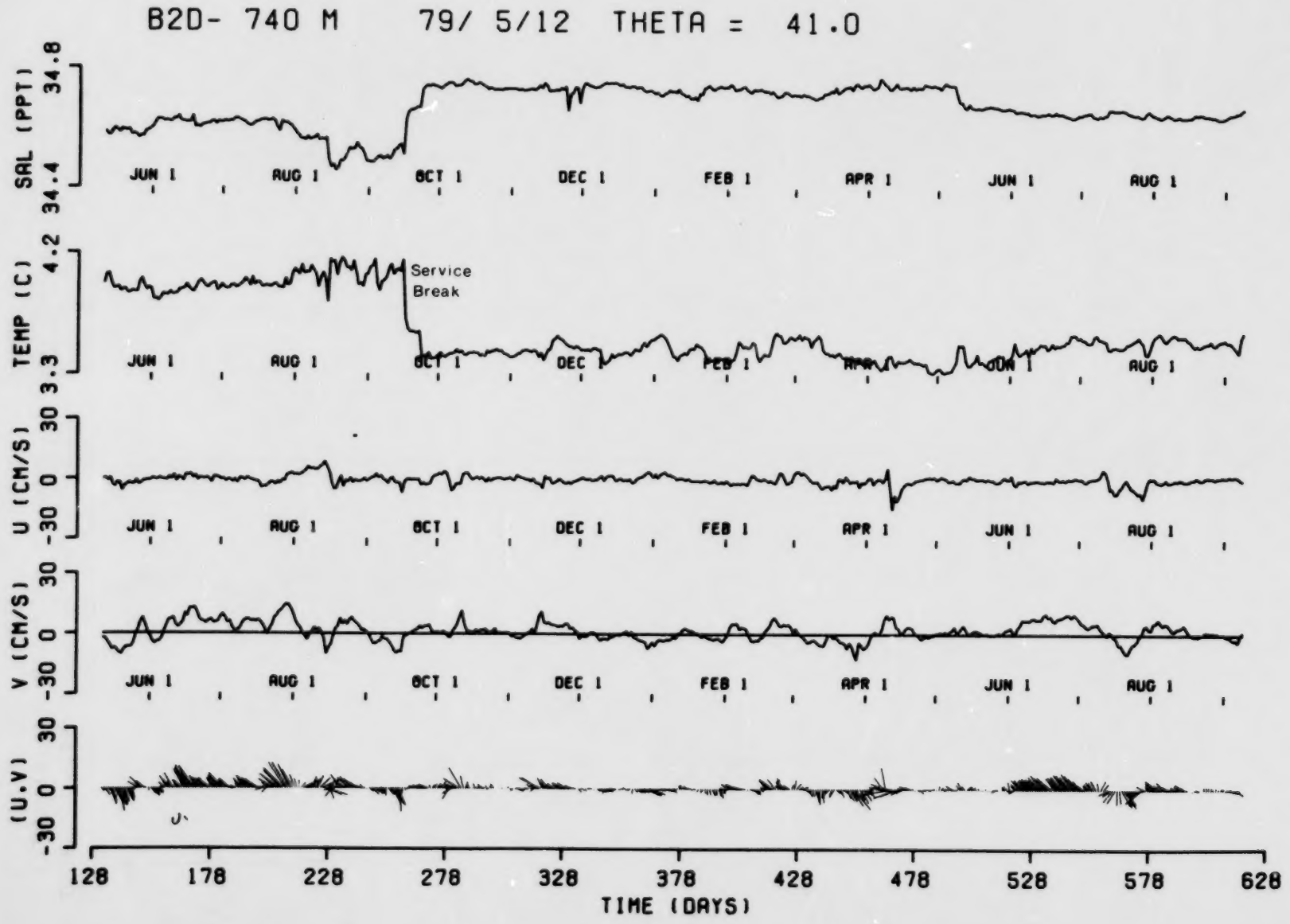

BAK- 0 M 79/ 5/ 8 THETA = 20.0
U (M/S)
V (M/S)
(U,V)
20
0
-20
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

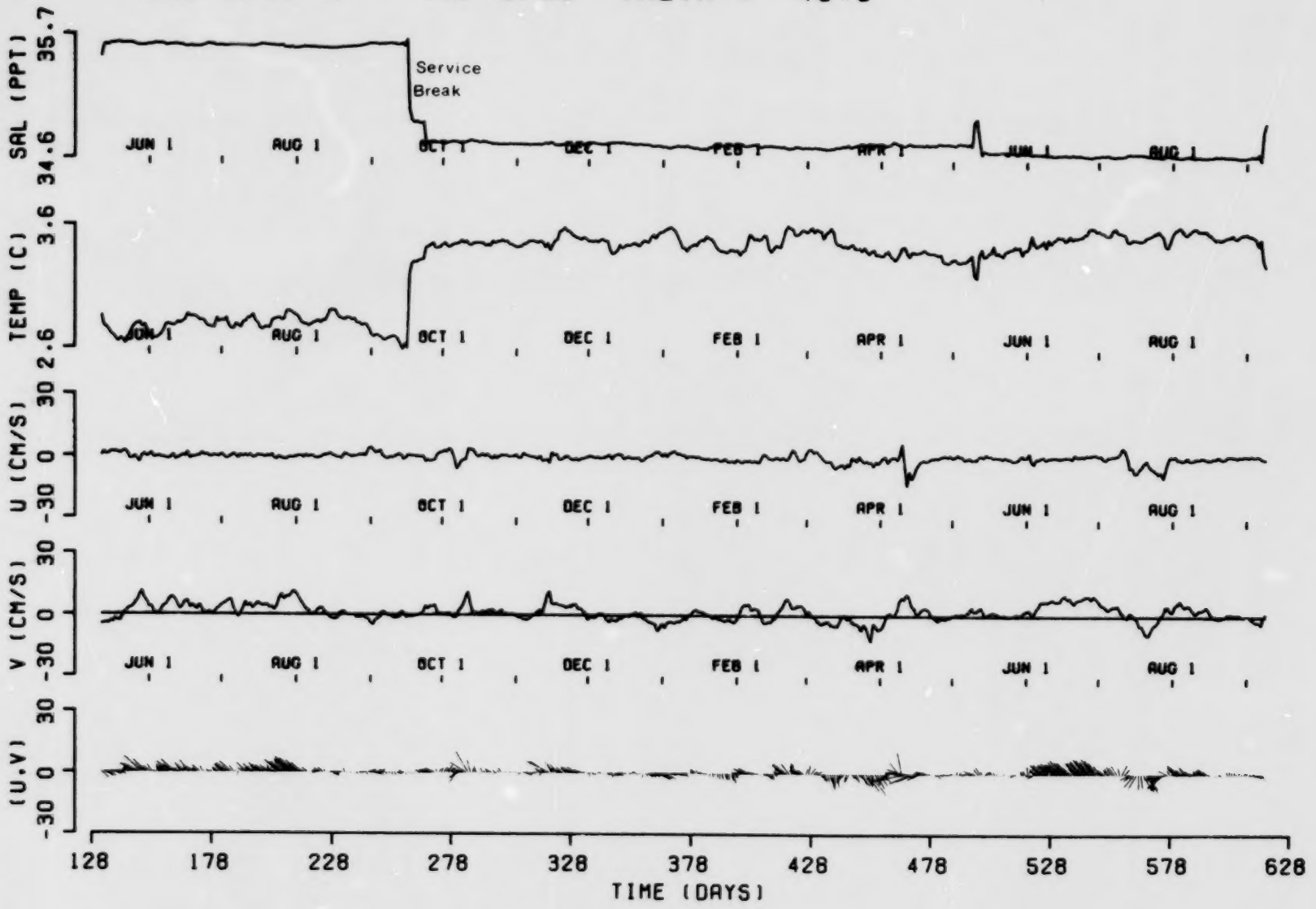
BROOKS PENINSULA MOORINGS

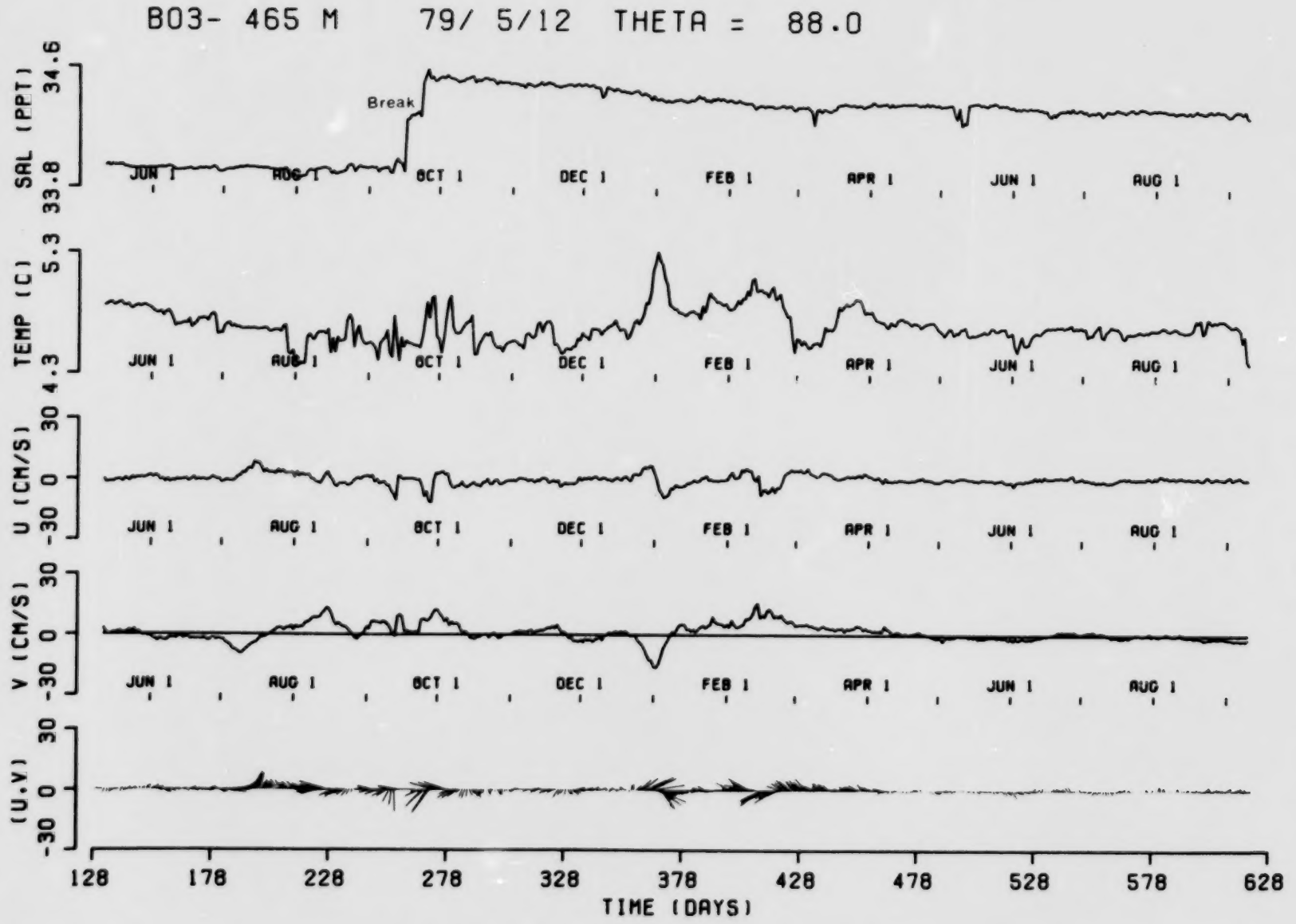

B01- 53 M 79/ 9/19 THETA = 36.0
TEMP (C)
13
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

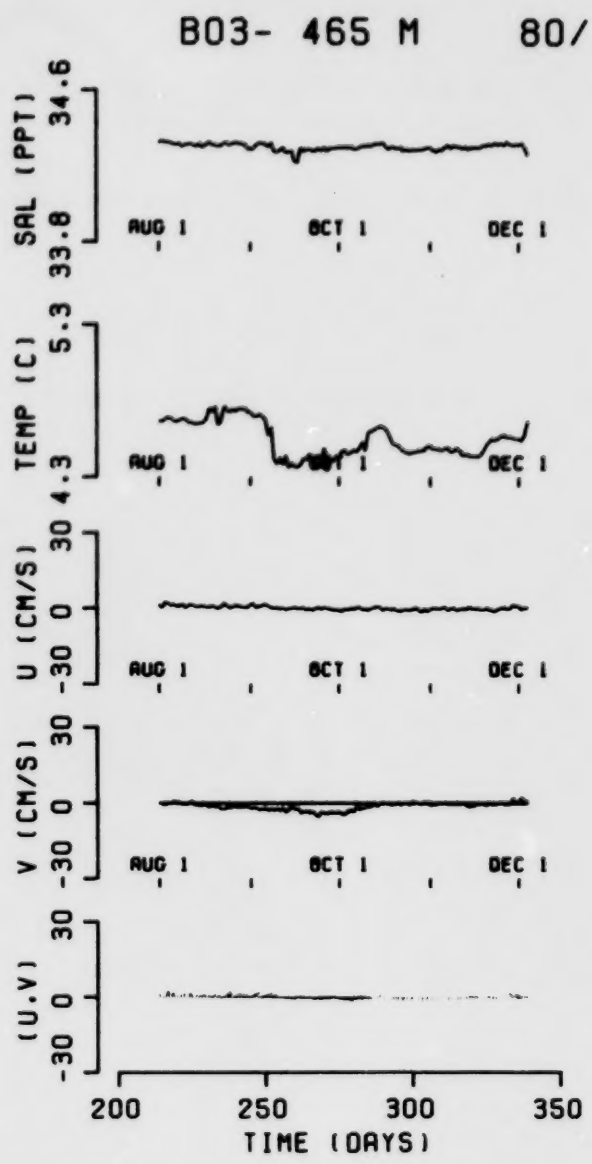

B01- 113 M 79/ 5/12 THETA = 43.0
SAL (PPT)
34
31
TEMP (C)
11
5
U (CM/S)
V (CM/S)
60
0
-60
(U.V)
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

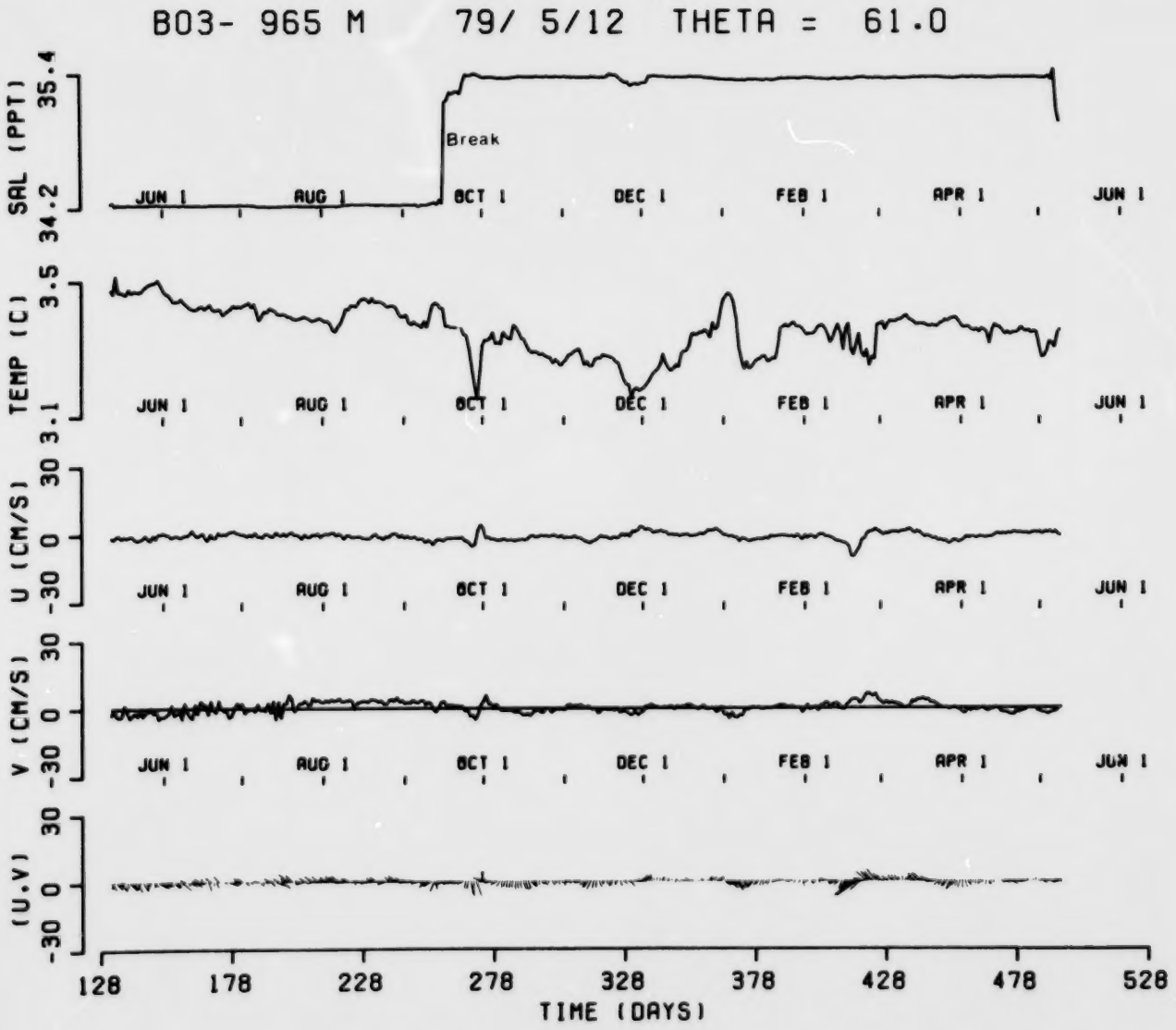

B02- 475 M 79/ 9/24 THETA = 36.0
SAL (PPT)
34.0
33.8
TEMP (C)
5.2
4.4
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U,V)
30
0
-30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)


B2D- 740 M 79/ 5/12 THETA = 41.0
SAL (PPT)
34.8
34.4
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
TEMP (C)
4.2
3.3
Service
Break
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U,V)
30
0
-30
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

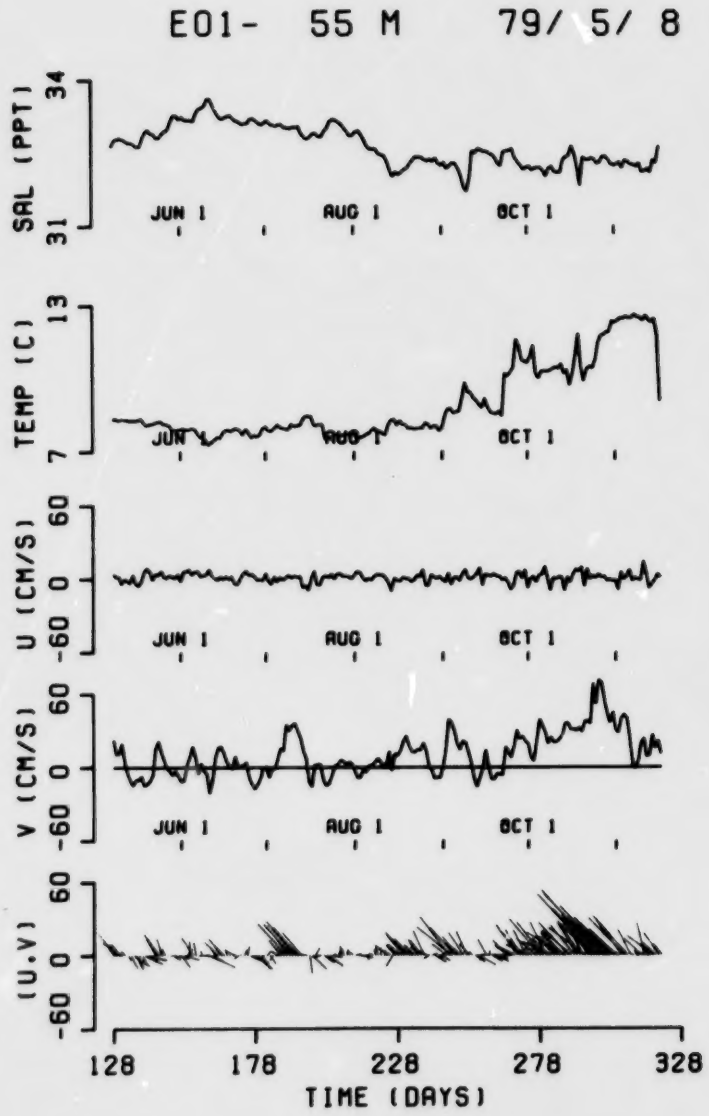

B2D-1240 M 79/ 5/12 THETA = 48.0
SAL (PPT)
35.7
34.6
Service
Break
TEMP (C)
3.6
2.6
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U,V)
30
0
-30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

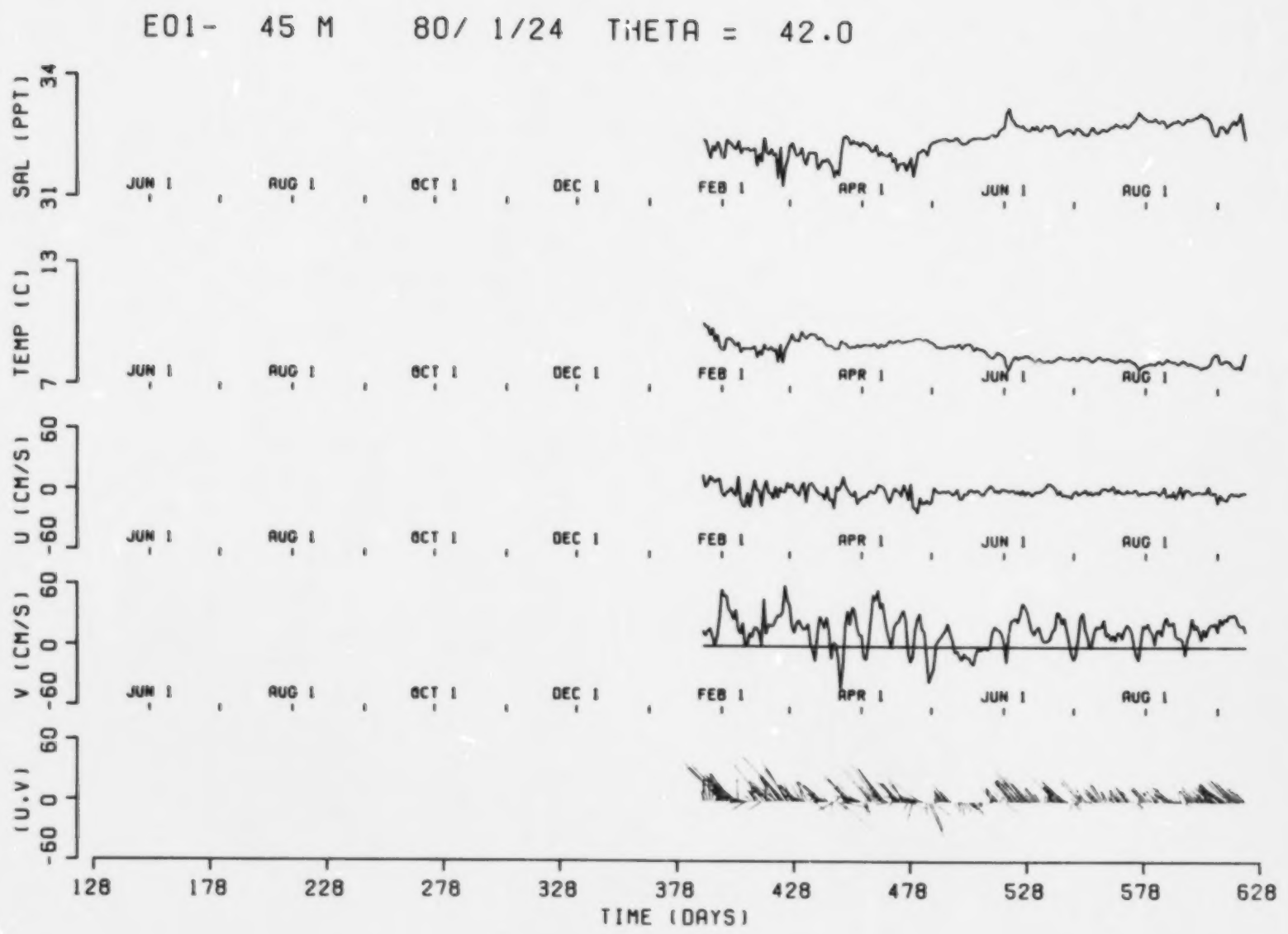

B03- 465 M 79/ 5/12 THETA = 88.0
SAL (PPT) 34.6 33.8
Break
TEMP (C) 5.3 4.3
U (CM/S) 30 0 -30
V (CM/S) 30 0 -30
(U,V) 30 0 -30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

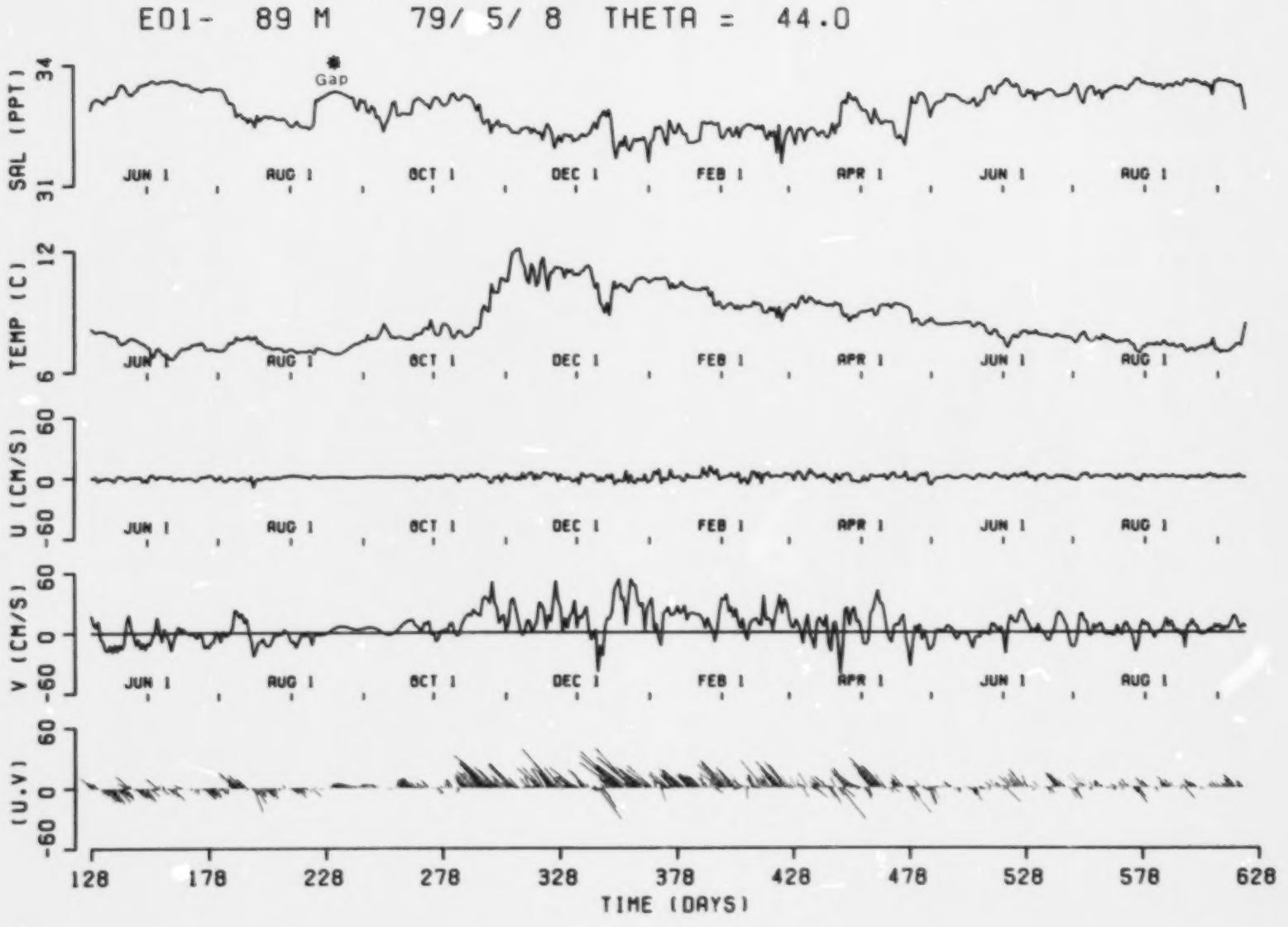

B03- 465 M 80/ 8/ 1 THETA = 88.0
SAL (PPT)
34.6
33.8
AUG 1
OCT 1
DEC 1
TEMP (C)
5.3
4.3
U (CM/S)
30
0
-30
V (CM/S)
(U.V)
200
250
300
350
TIME (DAYS)

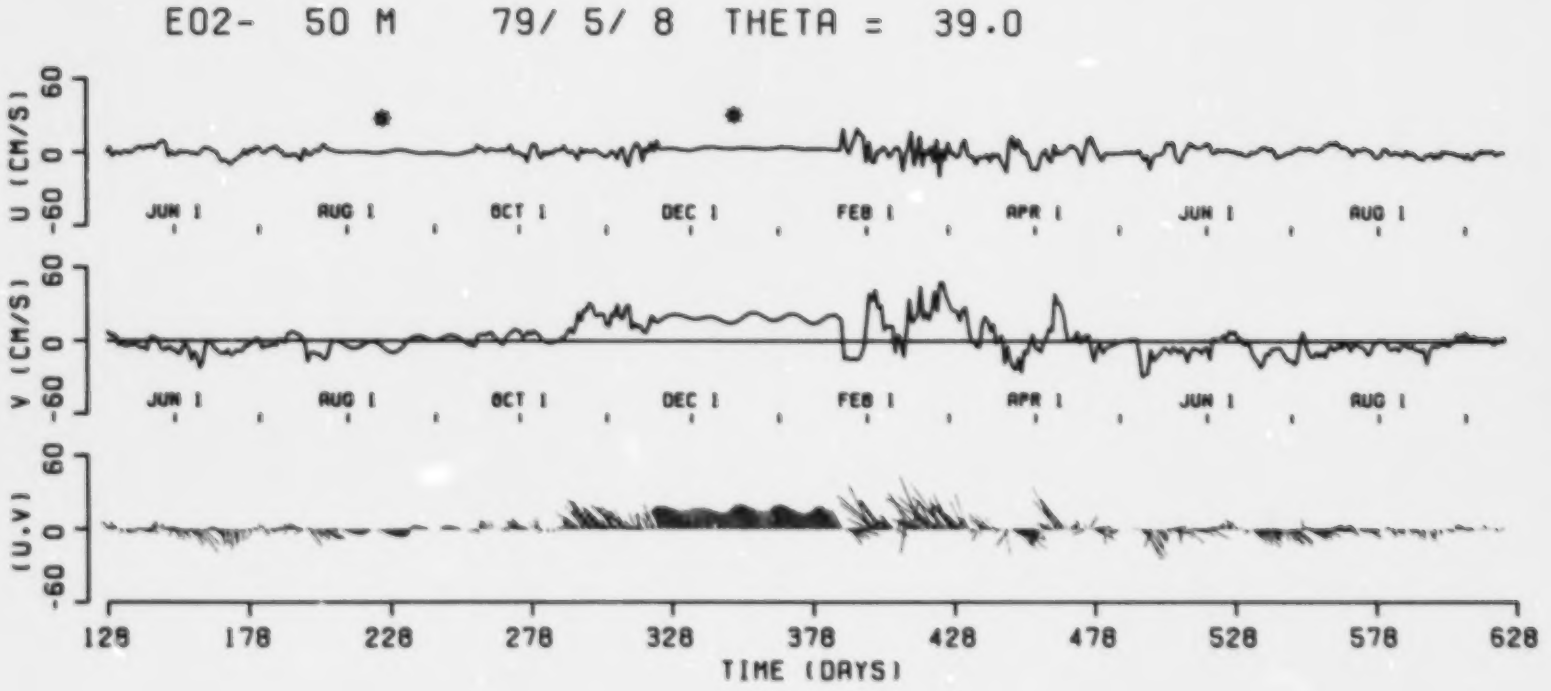

B03- 965 M 79/ 5/12 THETA = 61.0
SAL (PPT)
35.4
34.2
Break
TEMP (C)
3.5
3.1
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U,V)
30
0
-30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
128
178
228
278
328
378
428
478
528
TIME (DAYS)

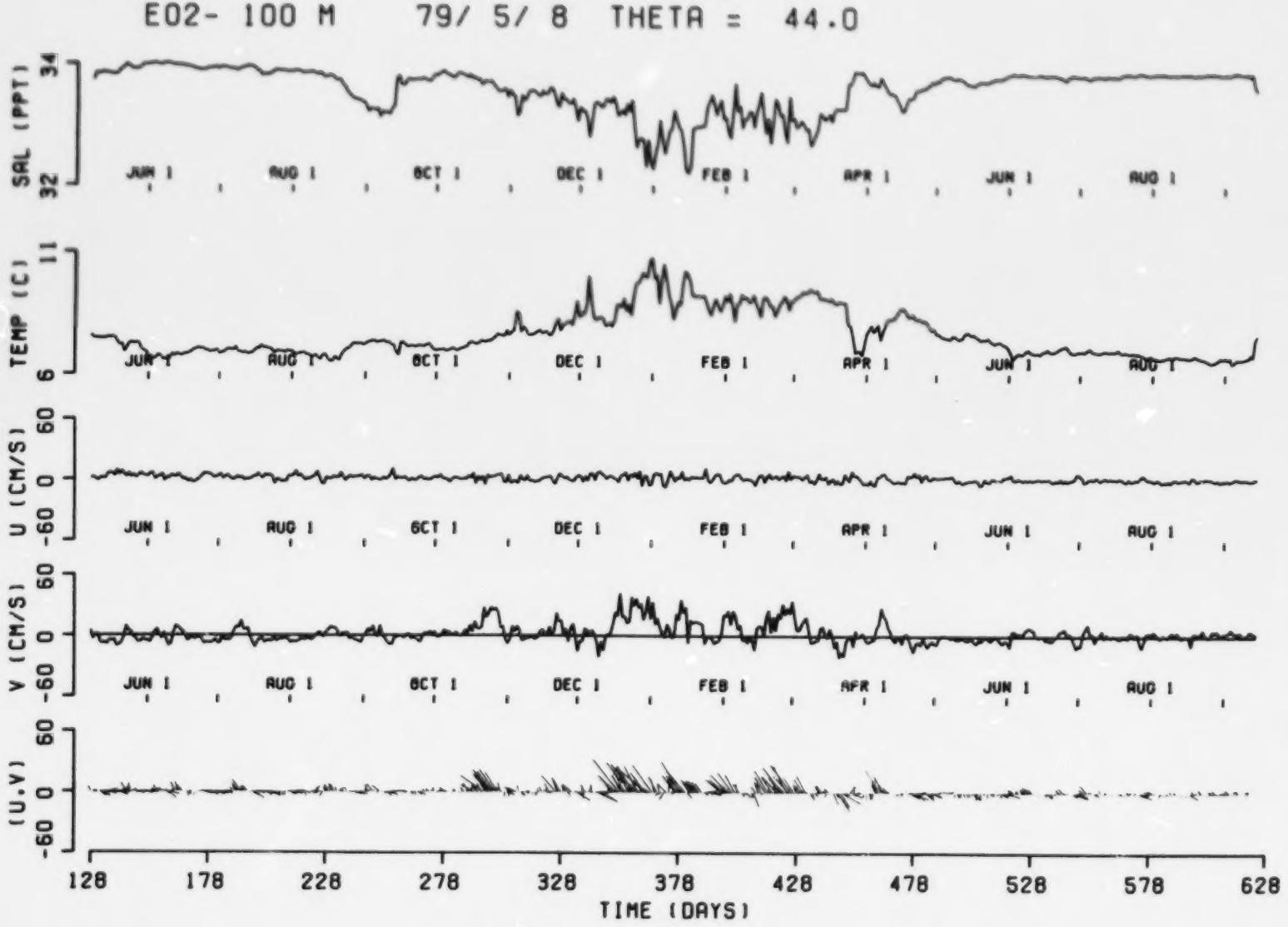
ESTEVAN POINT MOORINGS

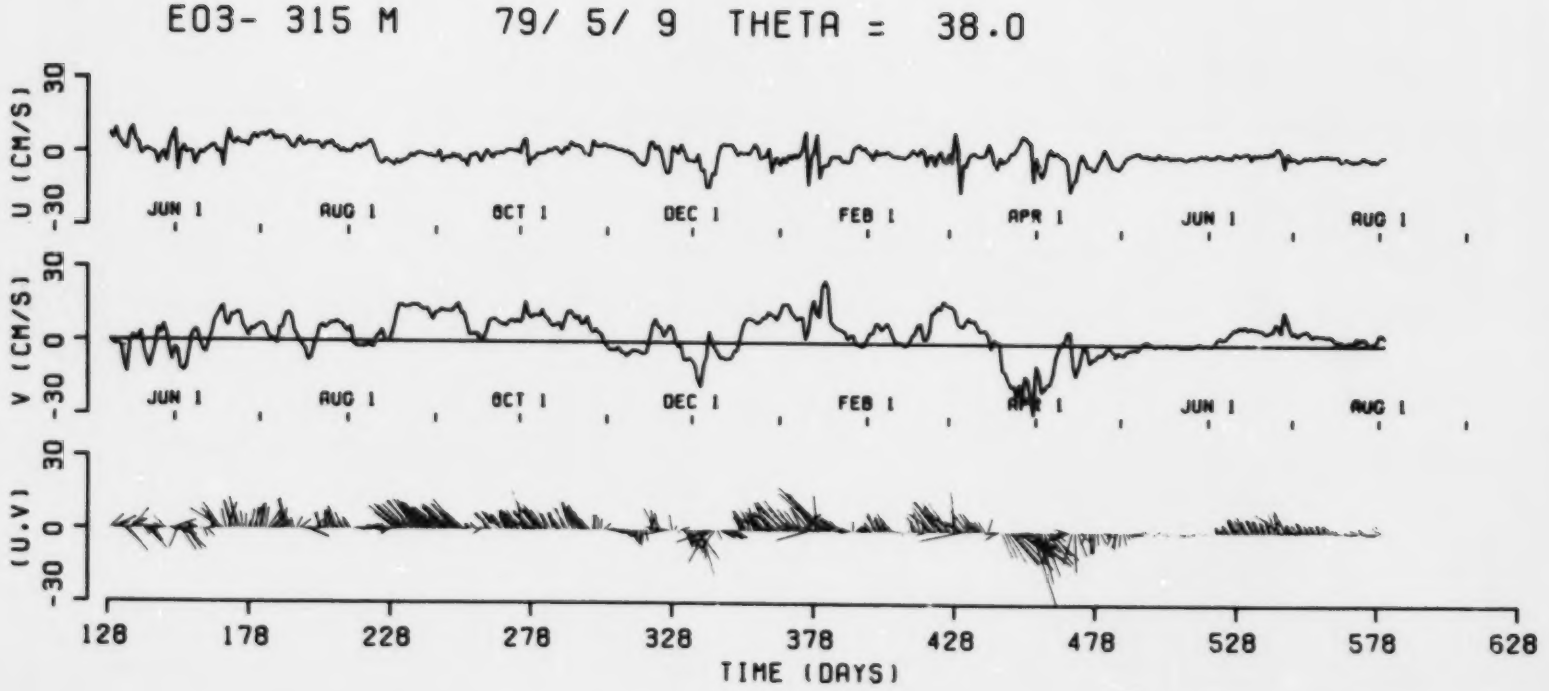

E01- 55 M 79/ 5/ 8 THETA = 45.0
SAL (PPT)
34
31
JUN 1
AUG 1
OCT 1
TEMP (C)
13
7
U (CM/S)
60
0
-60
V (CM/S)
(U.V)
128
178
228
278
328
TIME (DAYS)

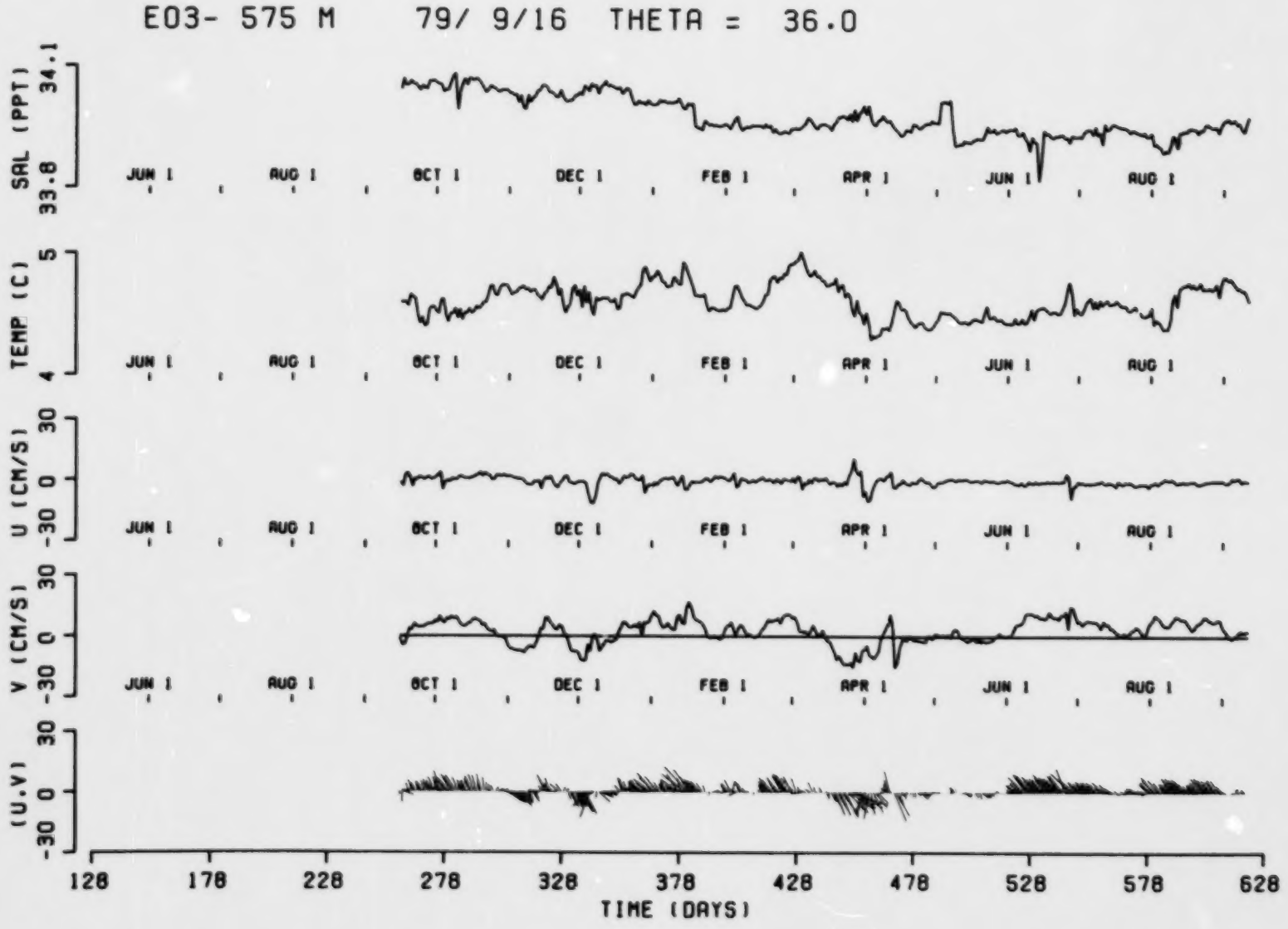

E01- 45 M 80/ 1/24 THETA = 42.0
SAL (PPT)
34
31
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
TEMP (C)
13
7
U (CM/S)
60
0
-60
V (CM/S)
(U,V)
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

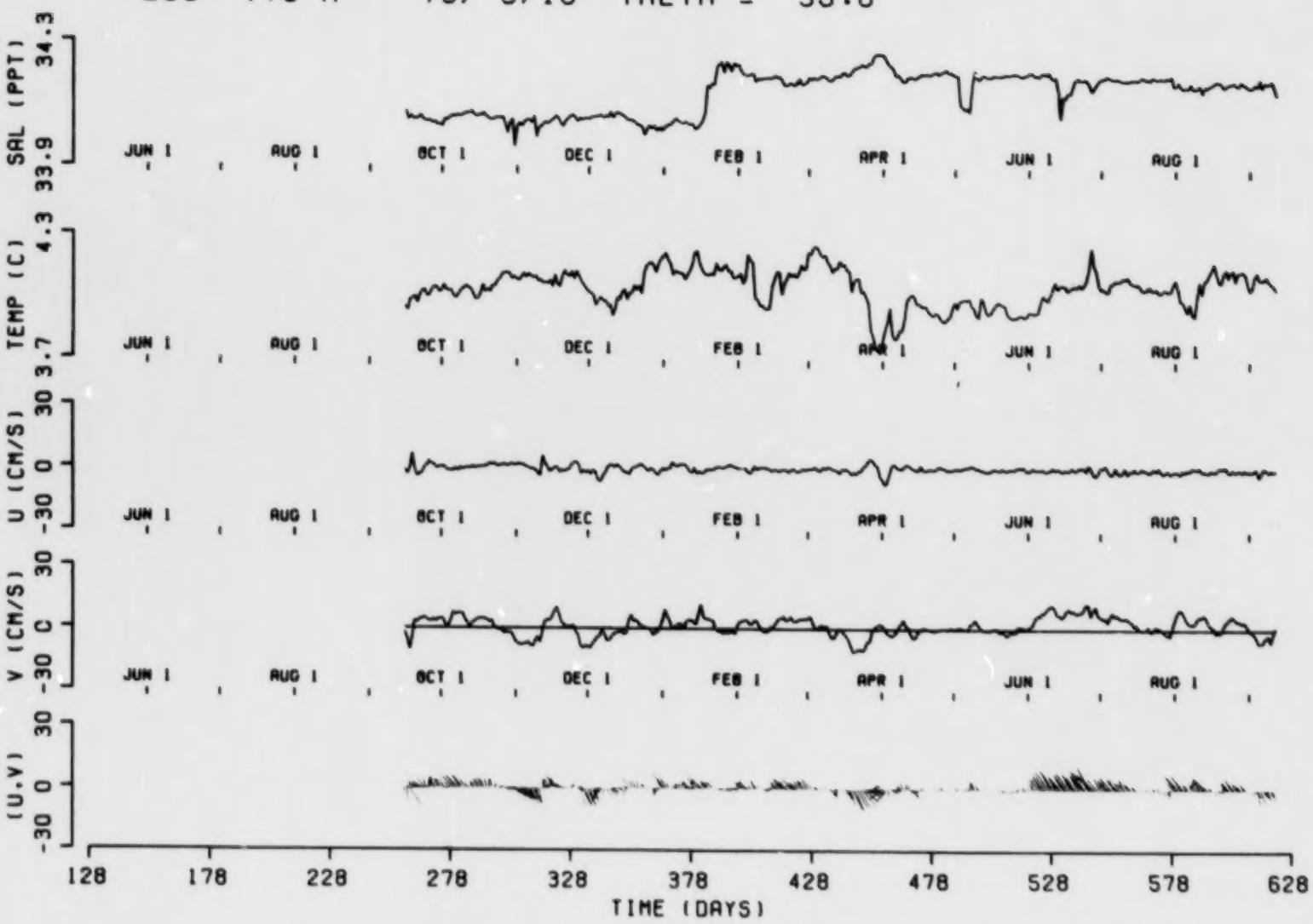

E01- 89 M 79/ 5/ 8 THETA = 44.0
Gap
SAL (PPT)
34
31
TEMP (C)
12
6
U (CM/S)
V (CM/S)
60
0
-60
(U.V)
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

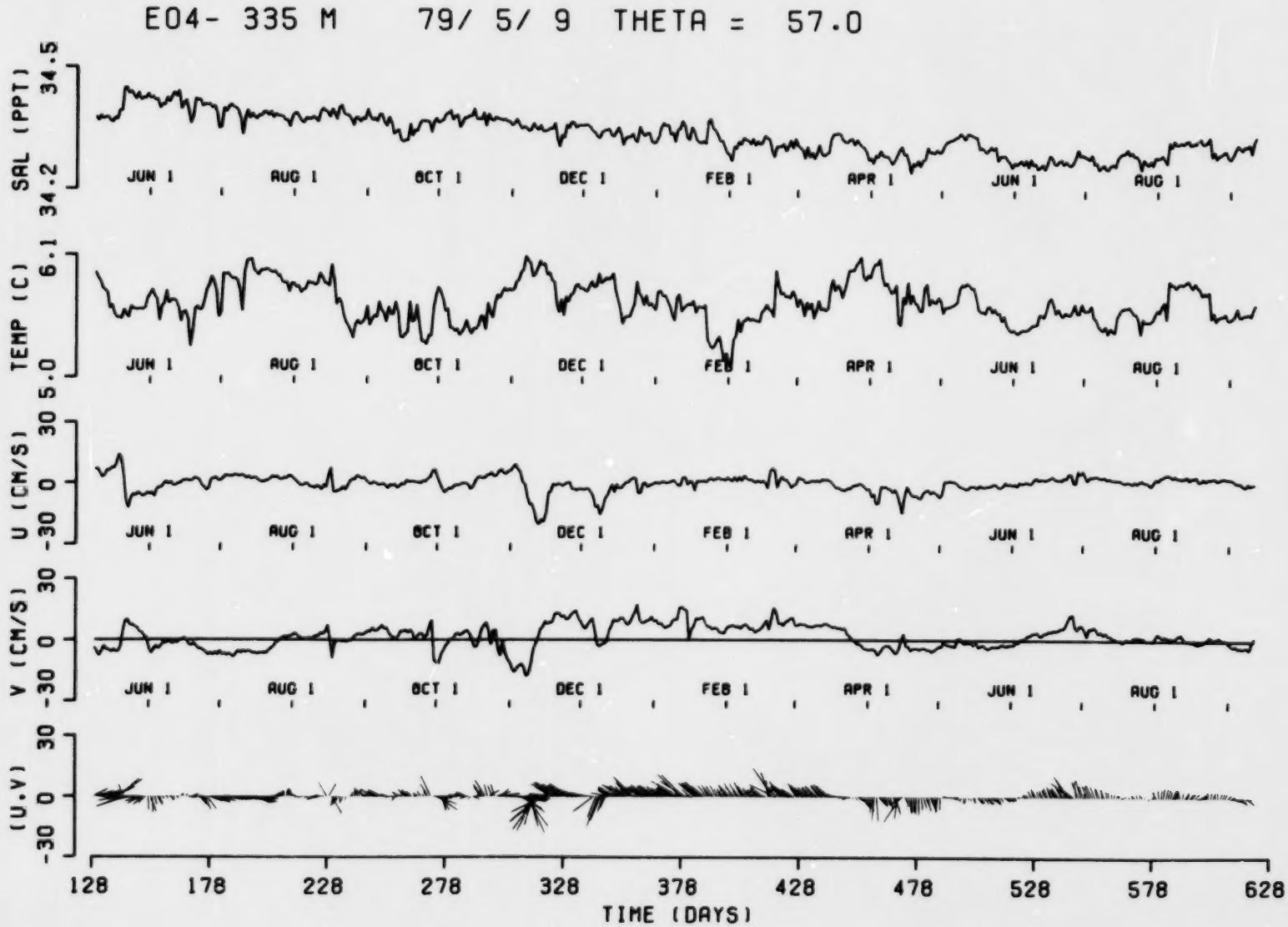

E02- 50 M 79/ 5/ 8 THETA = 39.0
U (CM/S)
V (CM/S)
(U,V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

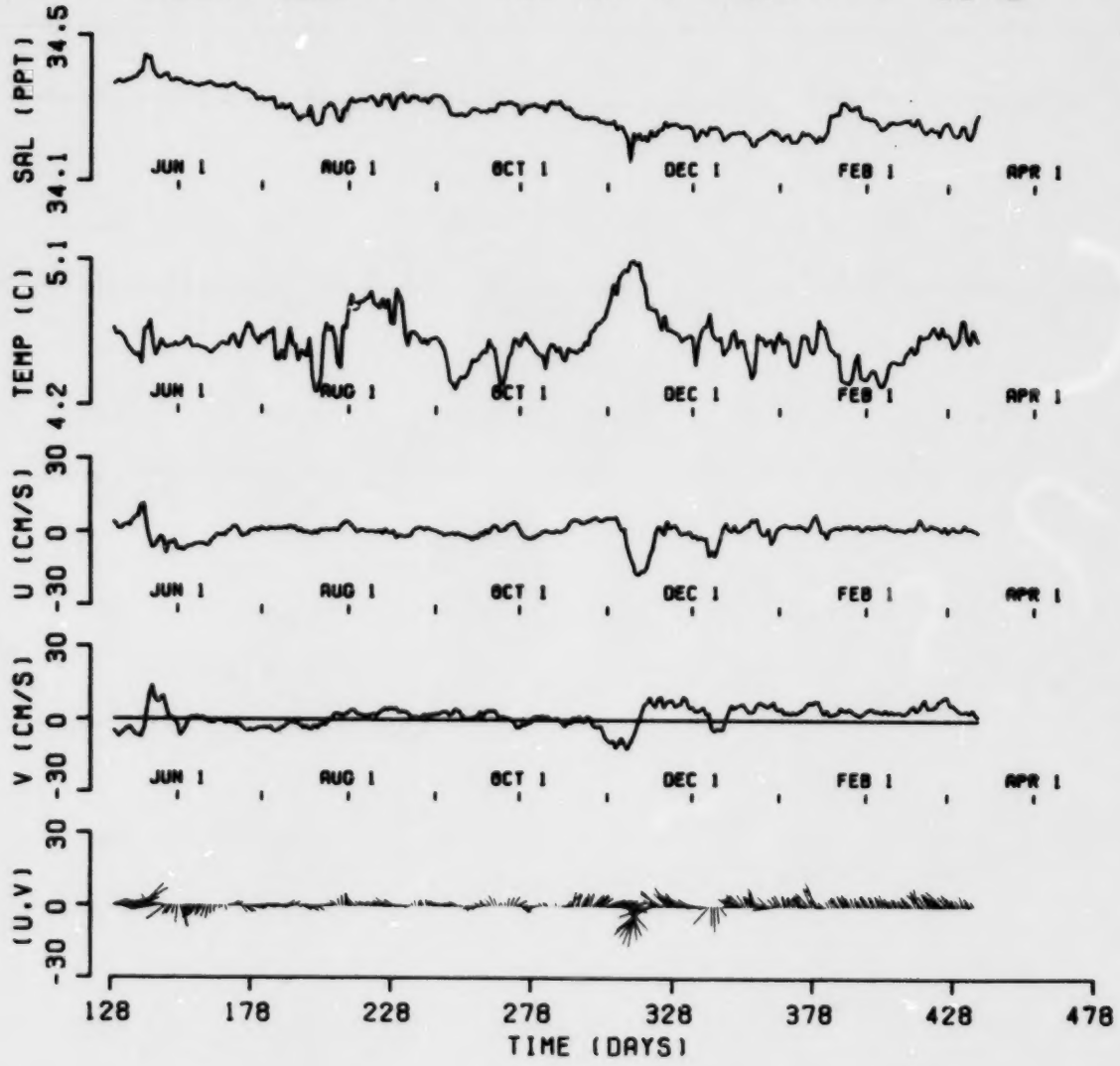

E02- 100 M 79/ 5/ 8 THETA = 44.0
SAL (PPT)
34
32
TEMP (C)
11
6
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

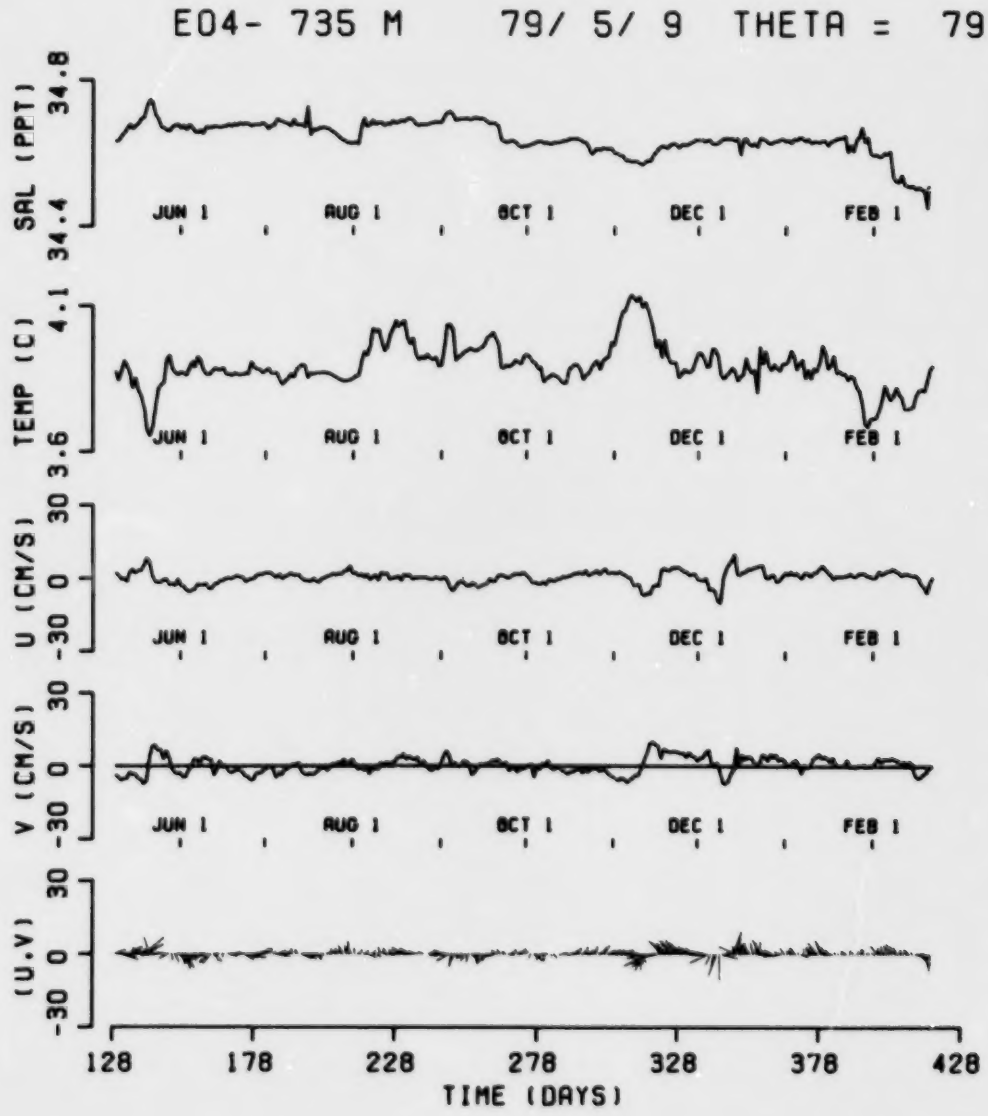

E03- 315 M 79/ 5/ 9 THETA = 38.0
U (CM/S)
V (CM/S)
(U,V)
30
0
-30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

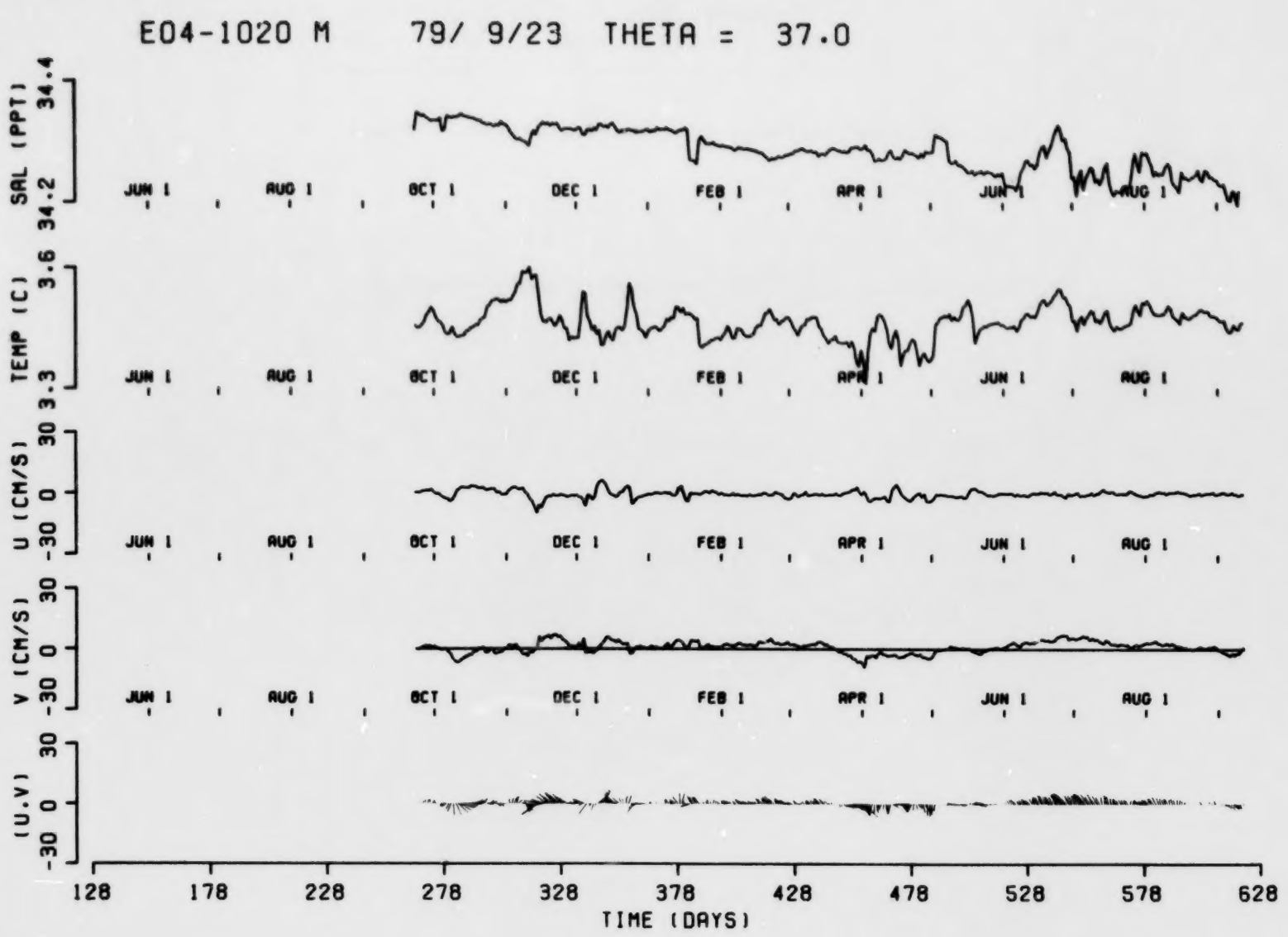

E03- 575 M 79/ 9/16 THETA = 36.0
SAL (PPT)
34.1
33.8
TEMP (C)
5
4
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U,V)
30
0
-30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

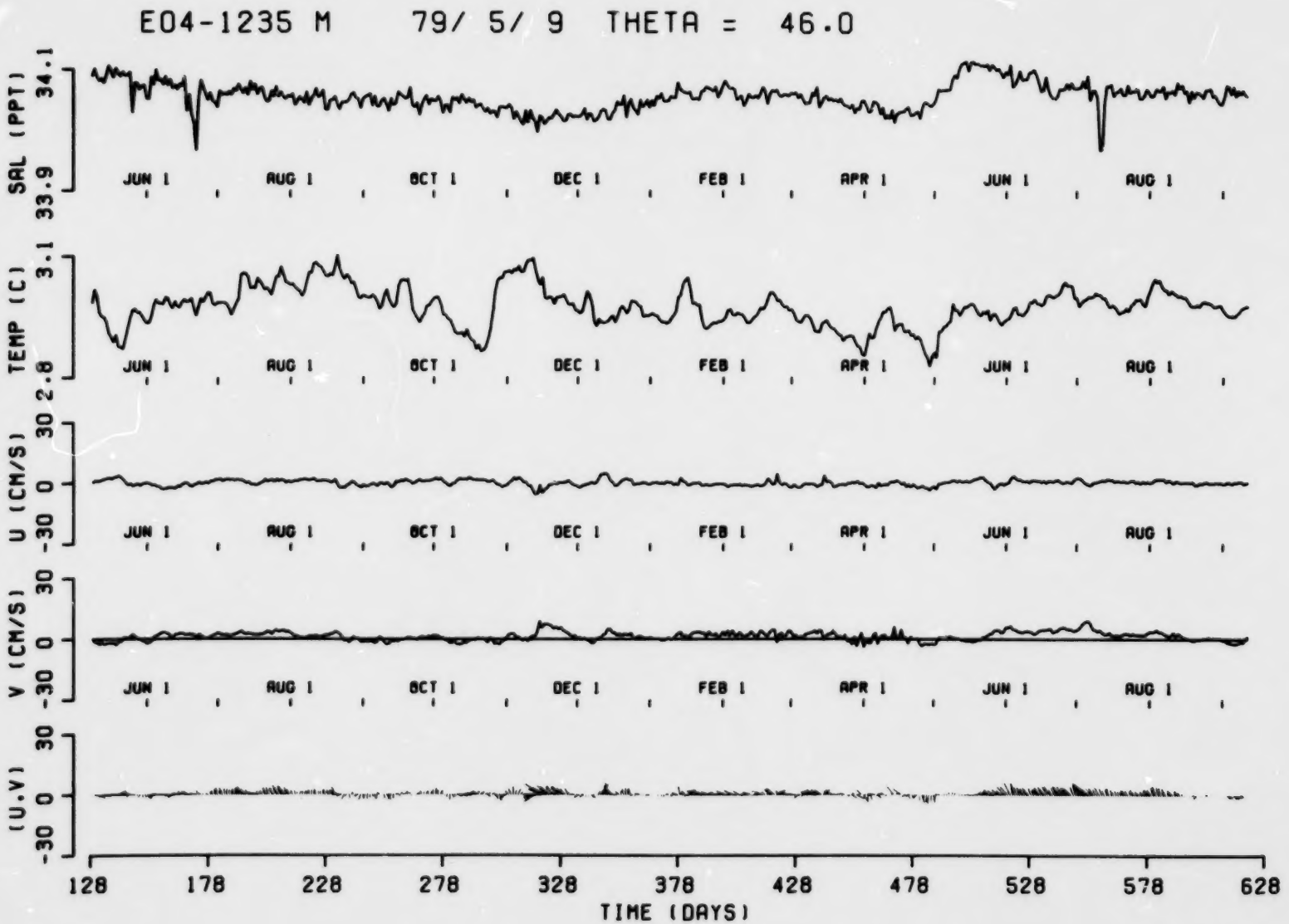

E03- 775 M 79/ 9/16 THETA = 35.0
SAL (PPT) 33.9 34.3
TEMP (C) 3.7 4.3
U (CM/S) -30 0 30
V (CM/S) -30 0 30
(U,V) -30 0 30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

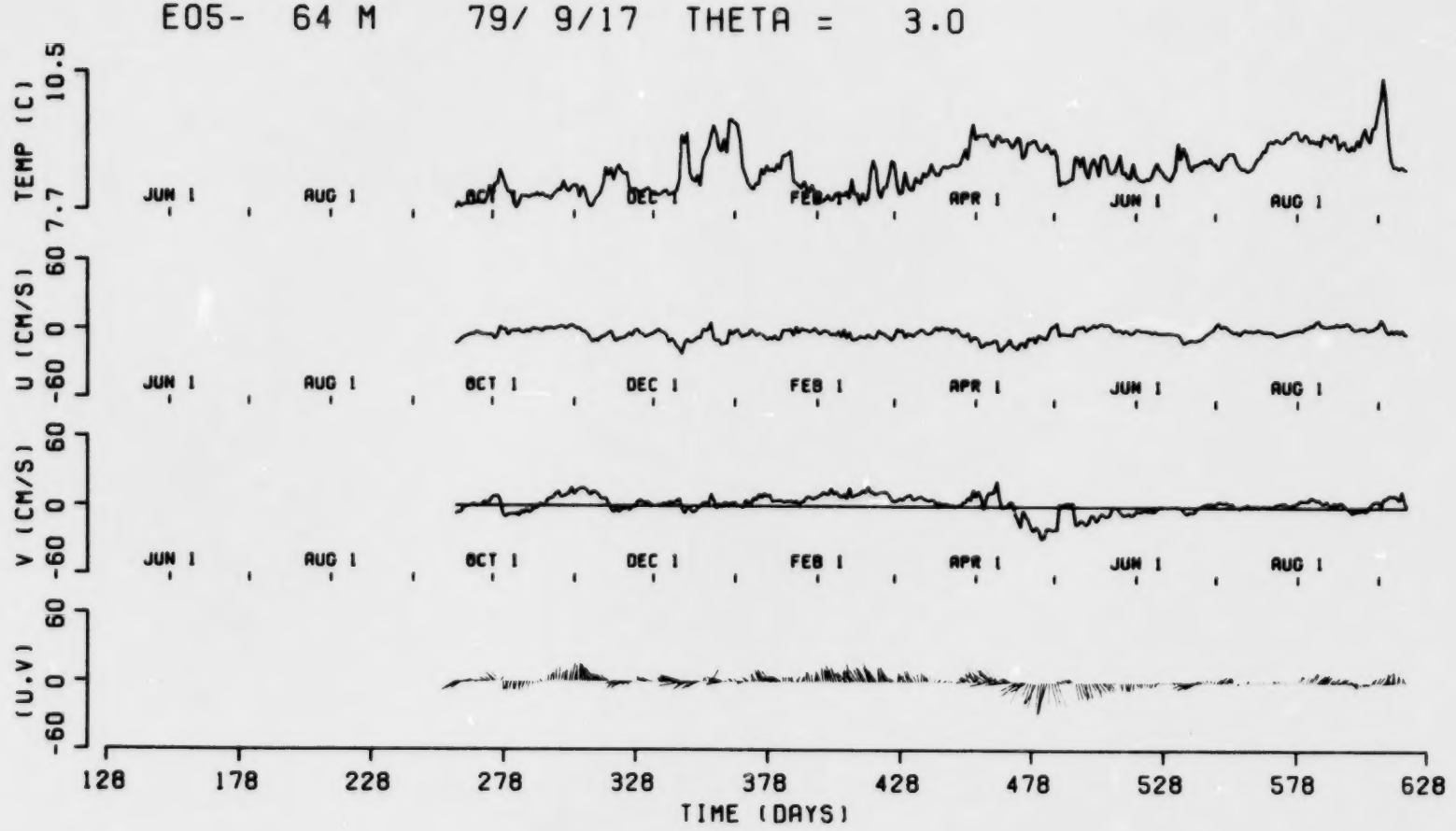

E04- 335 M 79/ 5/ 9 THETA = 57.0
SAL (PPT)
34.5
34.2
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
TEMP (C)
6.1
5.0
U (CM/S)
30
0
-30
V (CM/S)
(U,V)
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

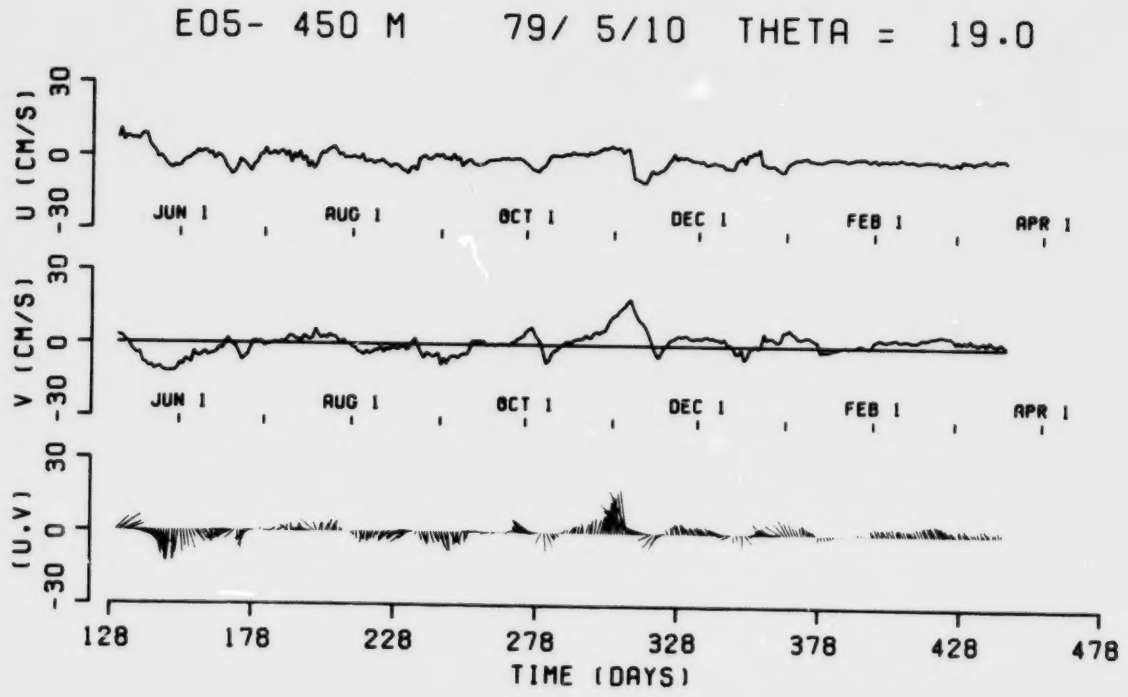

E04- 535 M 79/ 5/ 9 THETA = 66.0
SAL (PPT)
34.5
34.1
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
TEMP (C)
5.1
4.2
U (CM/S)
30
0
-30
V (CM/S)
(U,V)
128
178
228
278
328
378
428
478
TIME (DAYS)

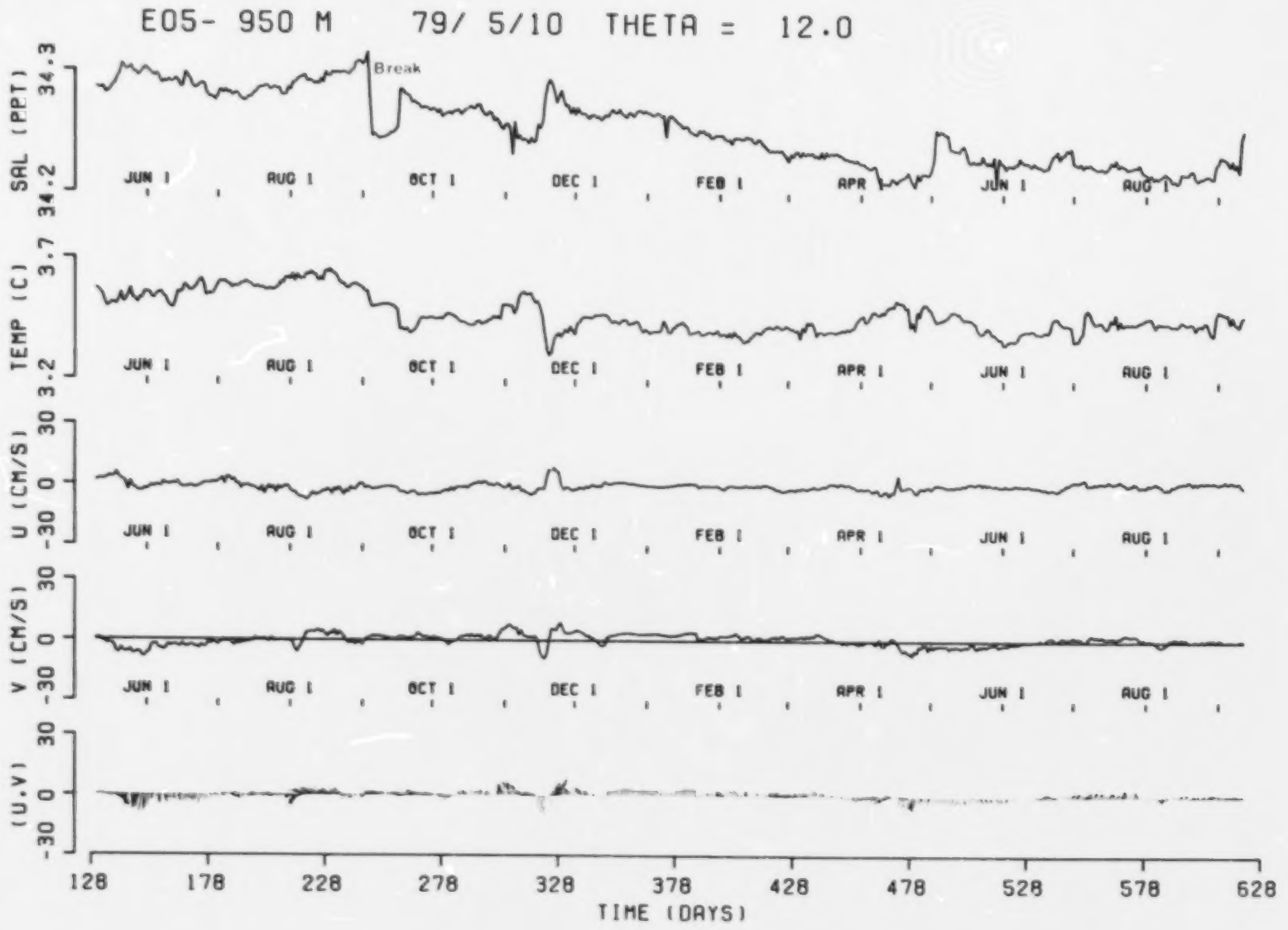

E04- 735 M 79/ 5/ 9 THETA = 79.0
SAL (PPT)
34.8
34.4
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
TEMP (C)
4.1
3.6
U (CM/S)
30
0
-30
V (CM/S)
(U.V)
128
178
228
278
328
378
428
TIME (DAYS)

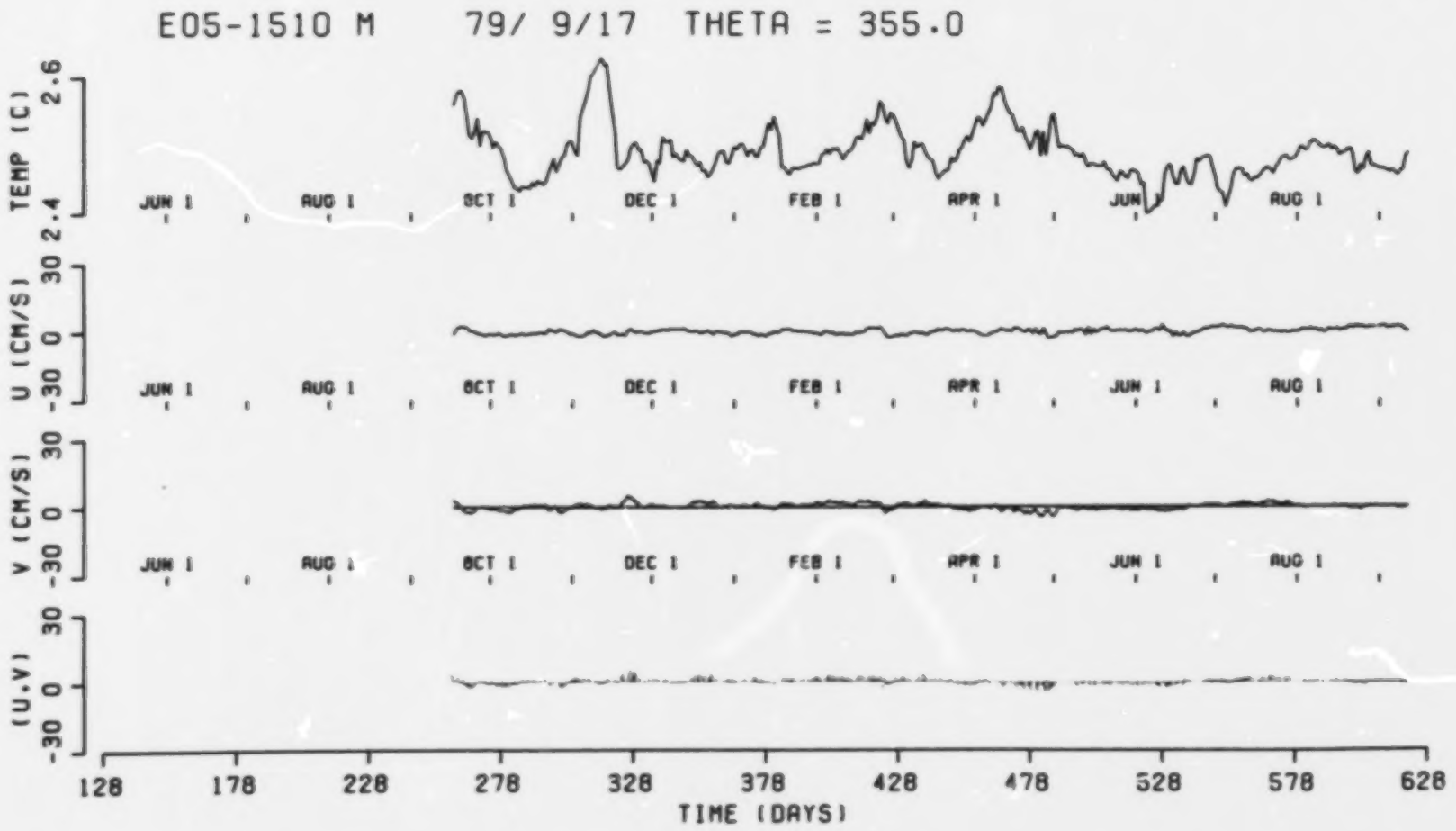

E04-1020 M 79/ 9/23 THETA = 37.0
SAL (PPT)
34.4
34.2
TEMP (C)
3.6
3.3
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U,V)
30
0
-30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)


E04-1235 M 79/ 5/ 9 THETA = 46.0
SAL (PPT)
34.1
33.9
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
TEMP (C)
3.1
2.8
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U,V)
30
0
-30
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)


E05- 64 M 79/ 9/17 THETA = 3.0
TEMP (C)
10.5
7.7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

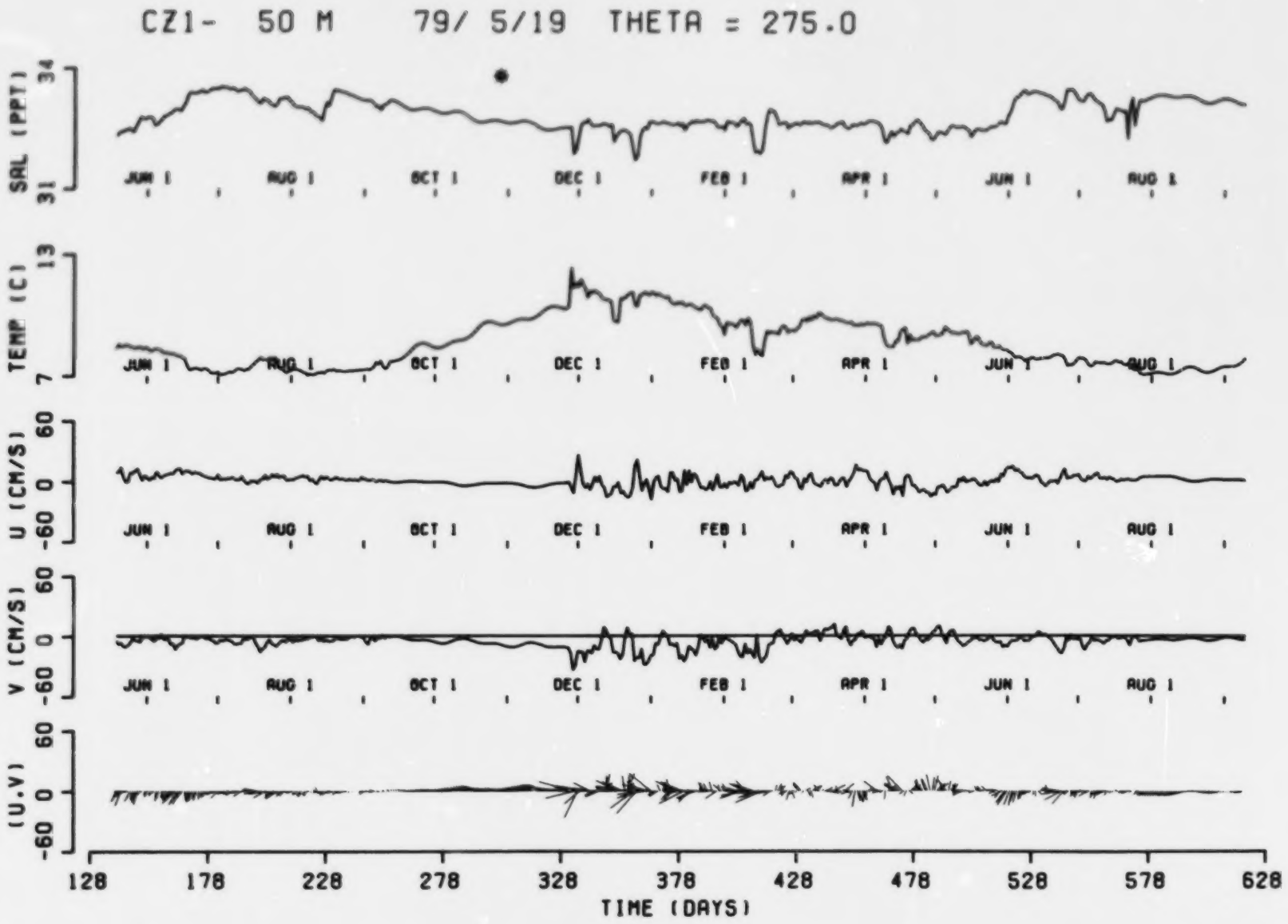

E05- 450 M 79/ 5/10 THETA = 19.0
U (CM/S)
V (CM/S)
(U,V)
30
0
-30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
128
178
228
278
328
378
428
478
TIME (DAYS)

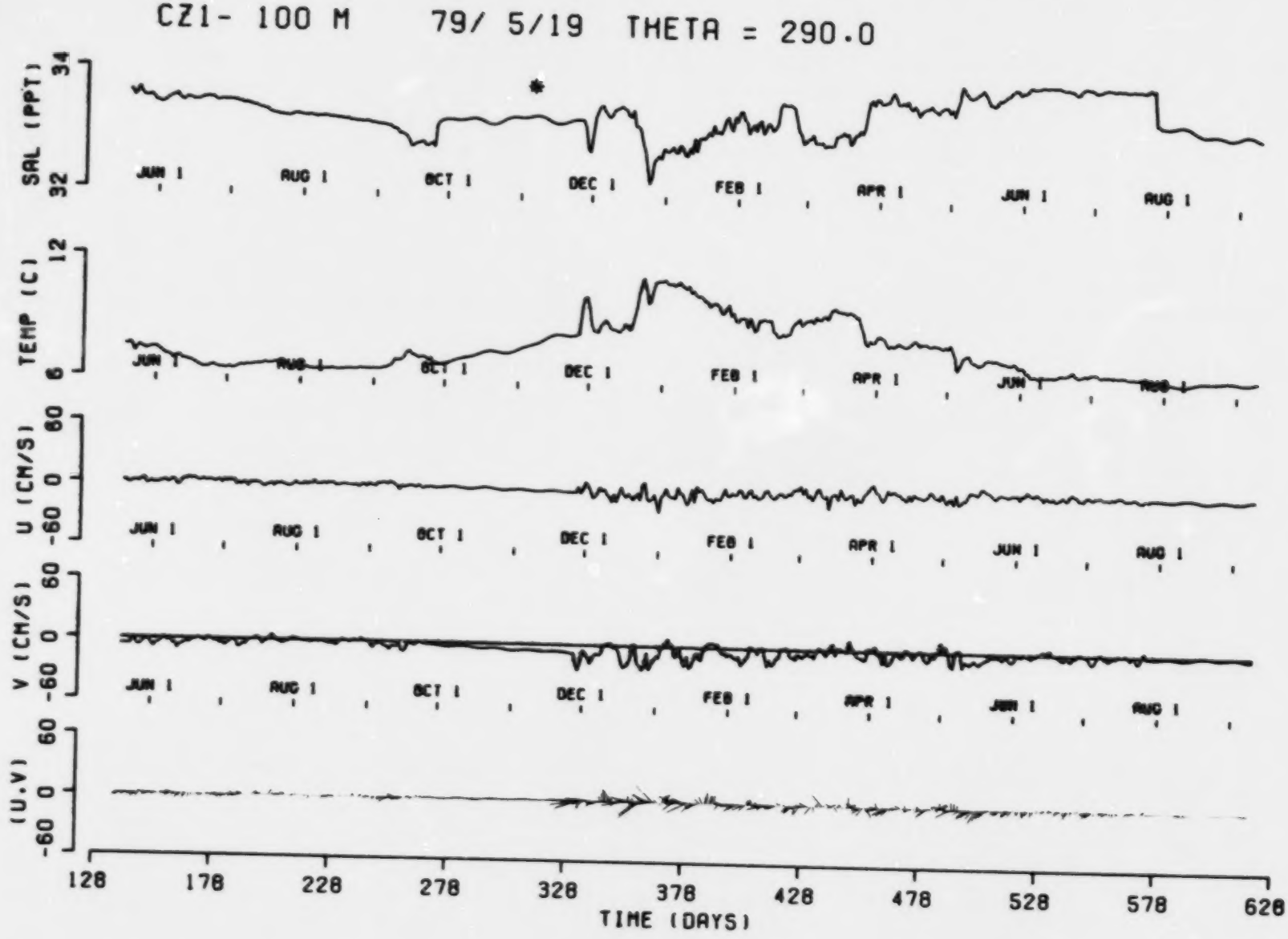

E05- 950 M 79/ 5/10 THETA = 12.0
Break
SAL (PPT)
34.3
34.2
TEMP (C)
3.7
3.2
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U,V)
30
0
-30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

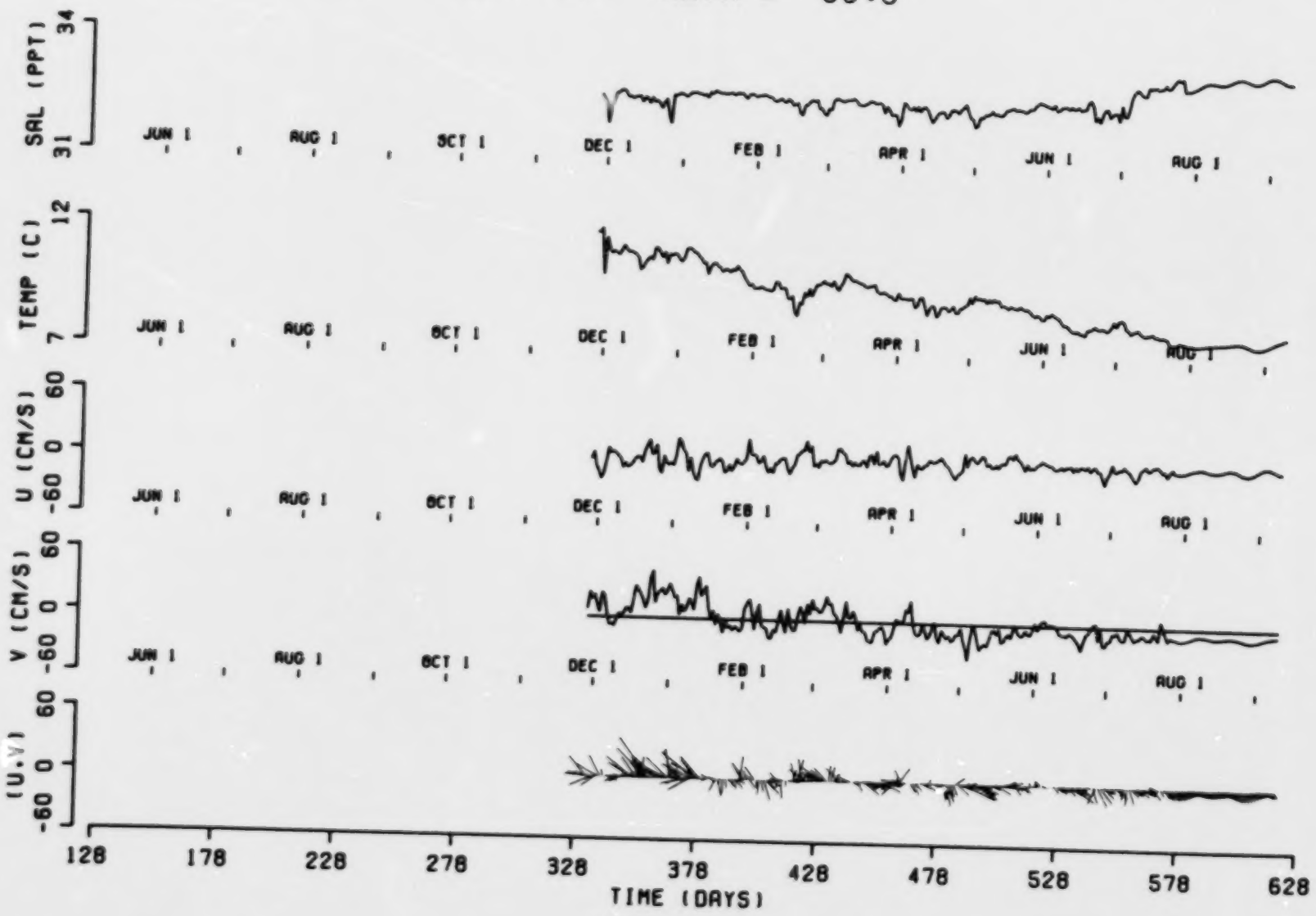

E05-1510 M 79/ 9/17 THETA = 355.0
TEMP (C)
2.4
2.6
U (CM/S)
V (CM/S)
(U,V)
-30
0
30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

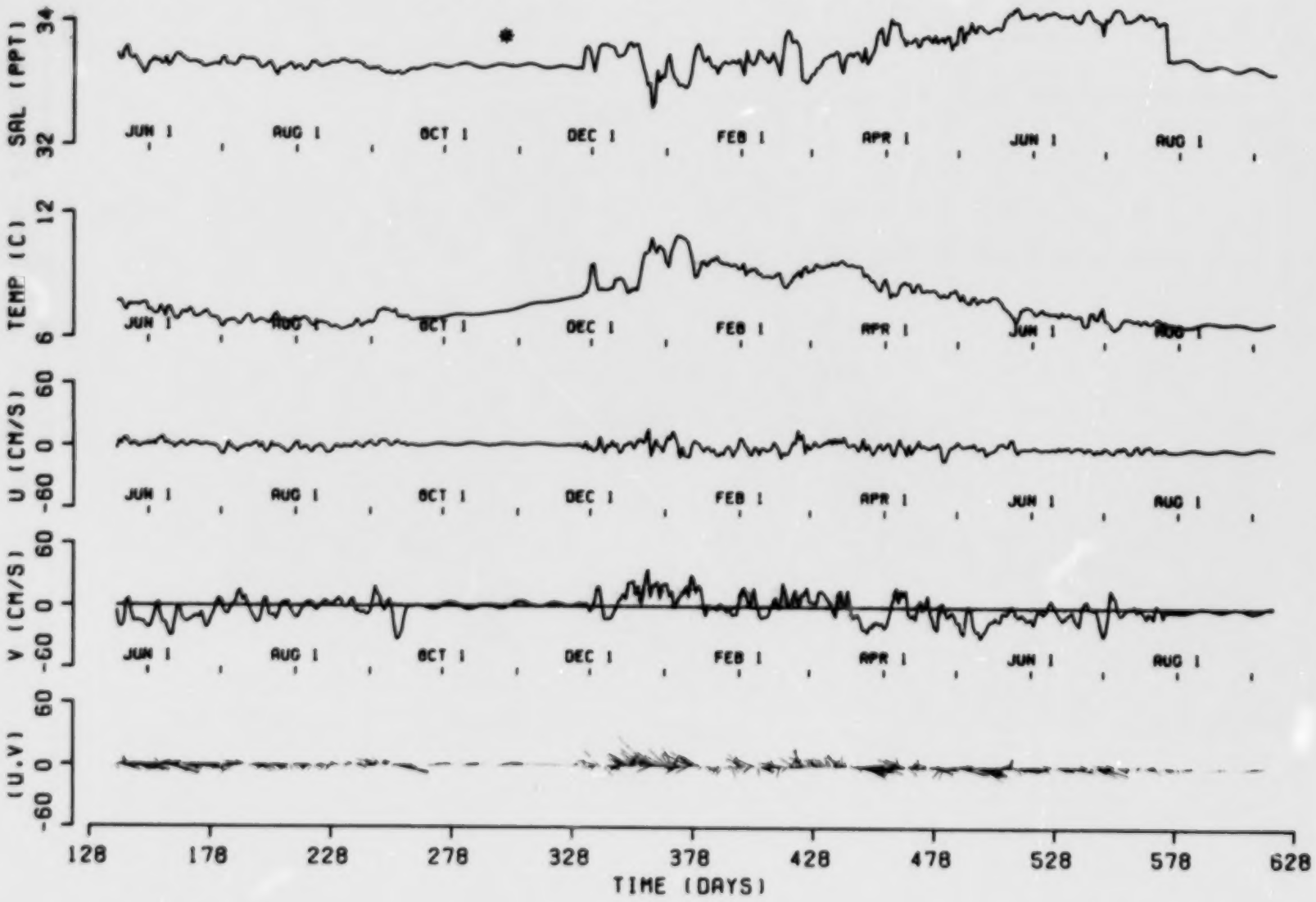
CARMANAH POINT MOORINGS

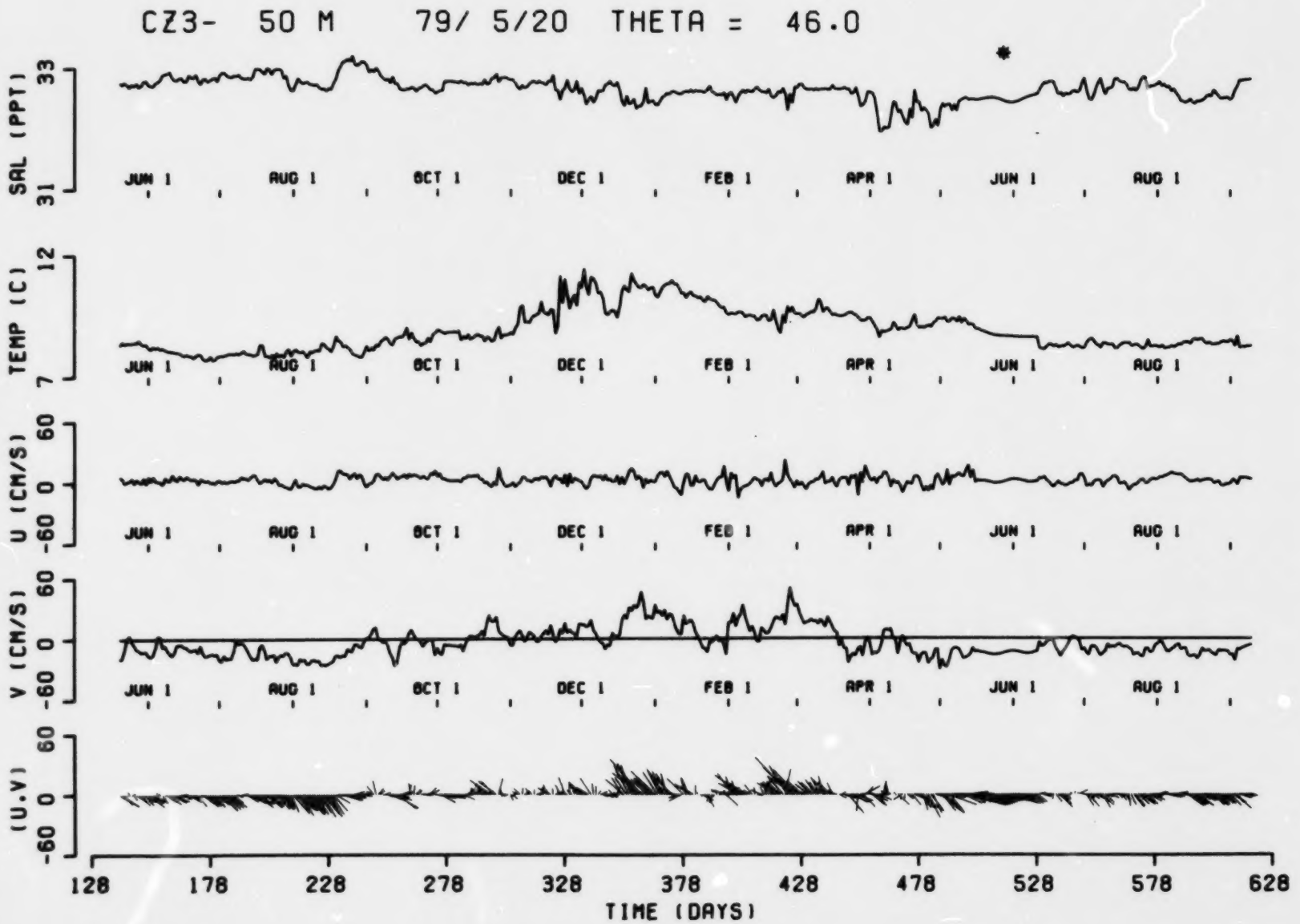
Long Records
Start: 19 May 1979

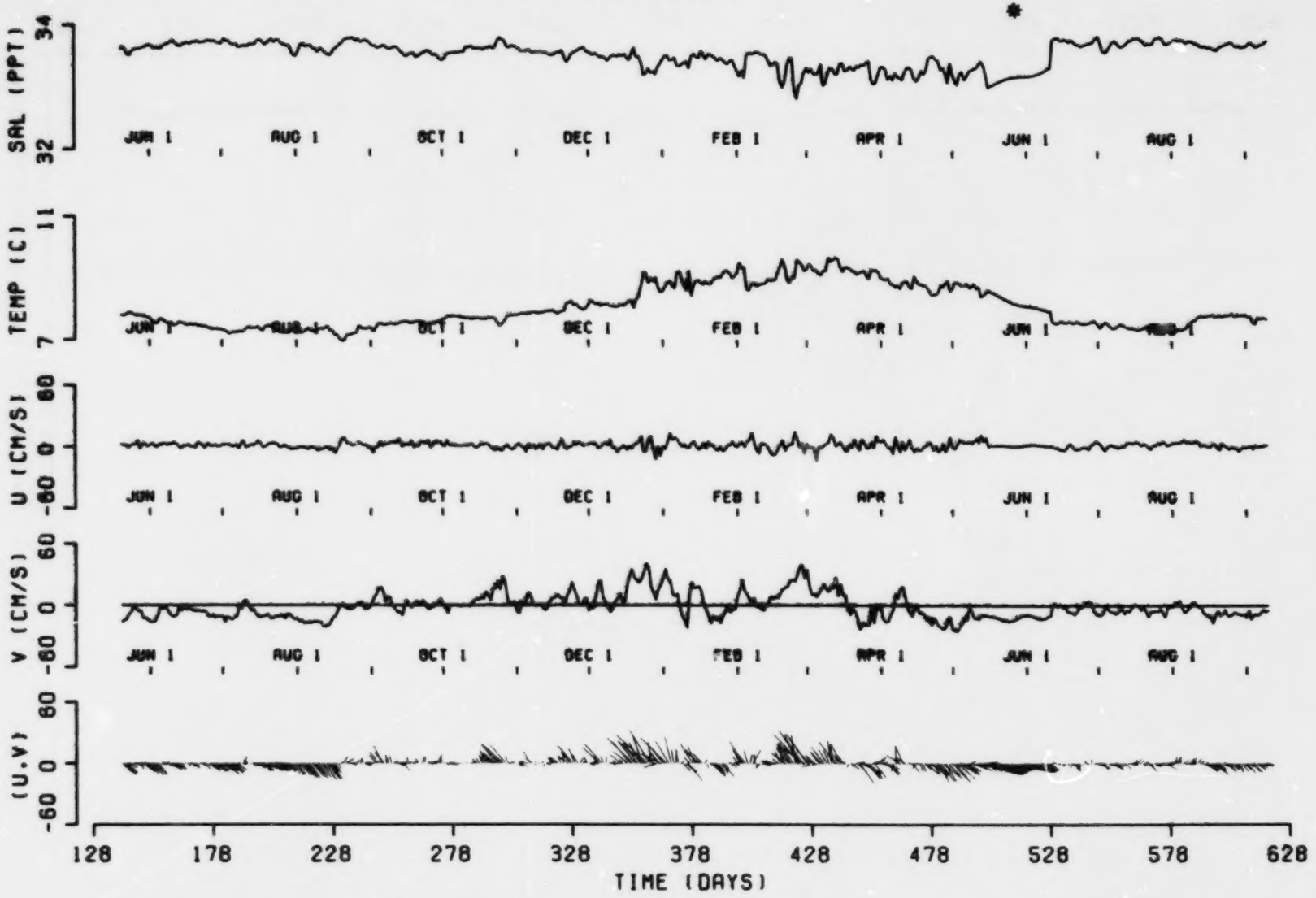

CZ1- 50 M 79/ 5/19 THETA = 275.0
SAL (PPT)
34
31
TEMP (C)
13
7
U (CM/S)
V (CM/S)
60
0
-60
(U,V)
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

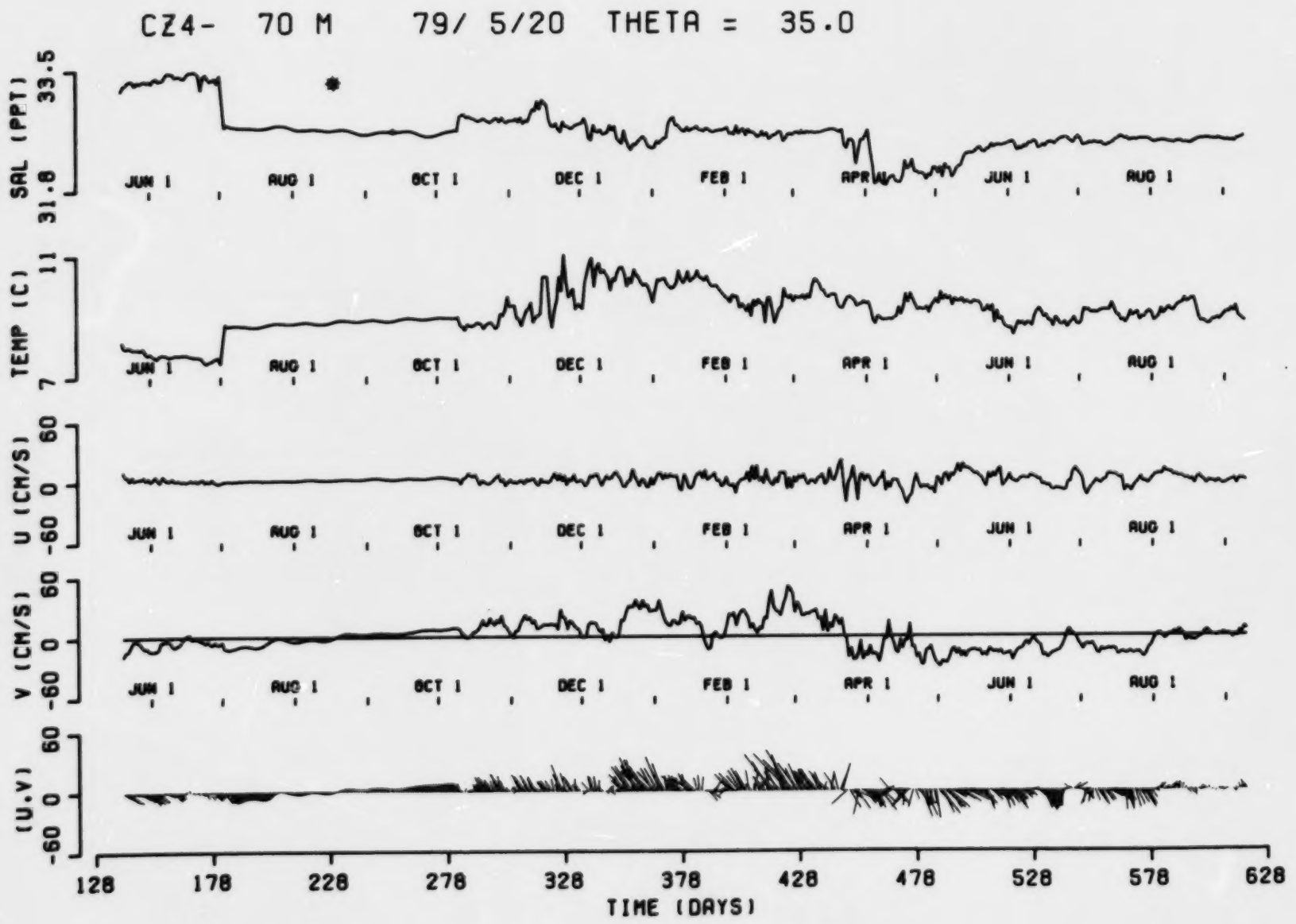

CZ1- 100 M 79/ 5/19 THETA = 290.0
SAL (PPT)
34
32
TEMP (C)
12
6
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

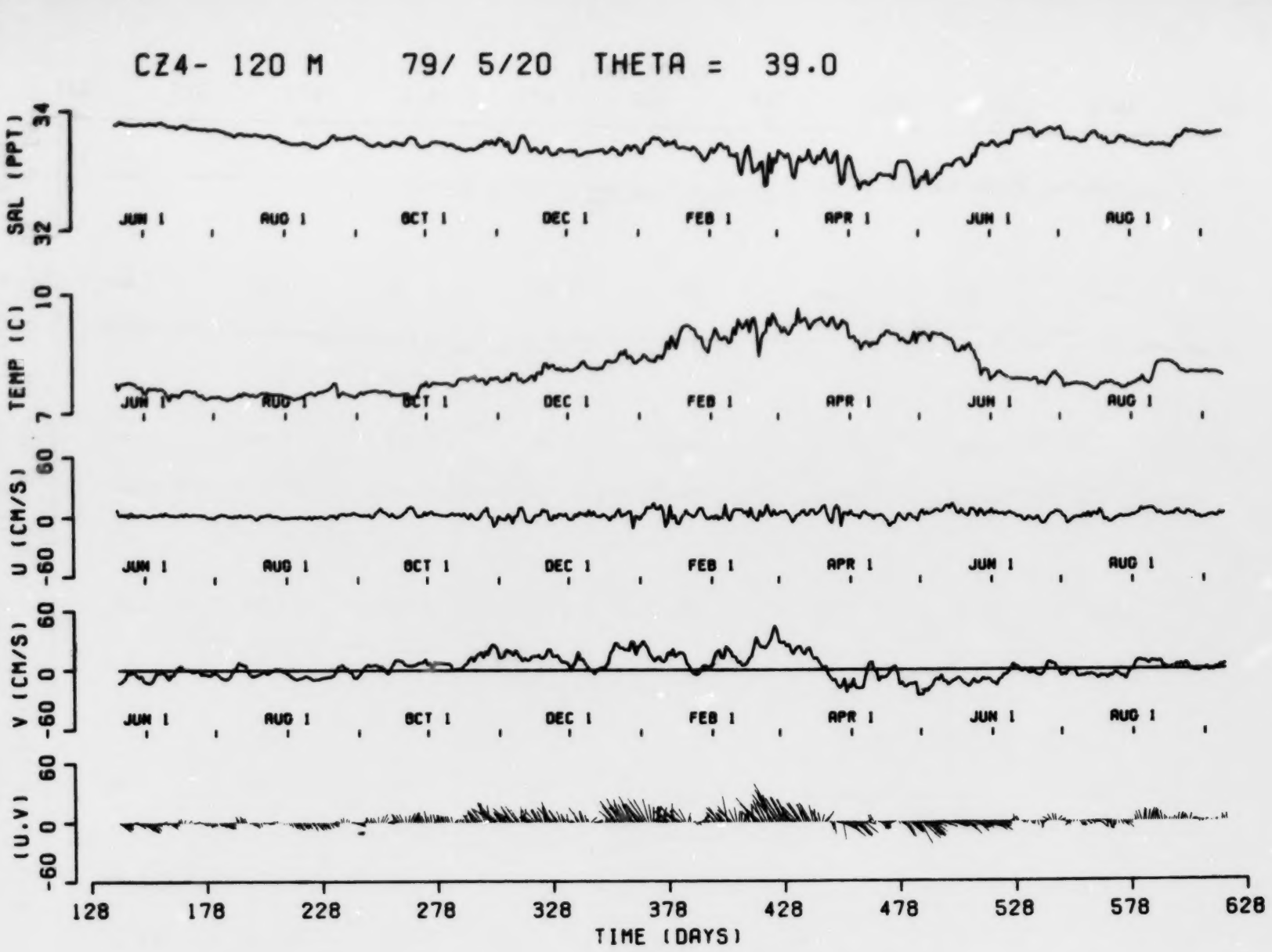

CZ2- 50 M 79/11/28 THETA = 53.0
SAL (PPT)
34
31
TEMP (C)
12
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

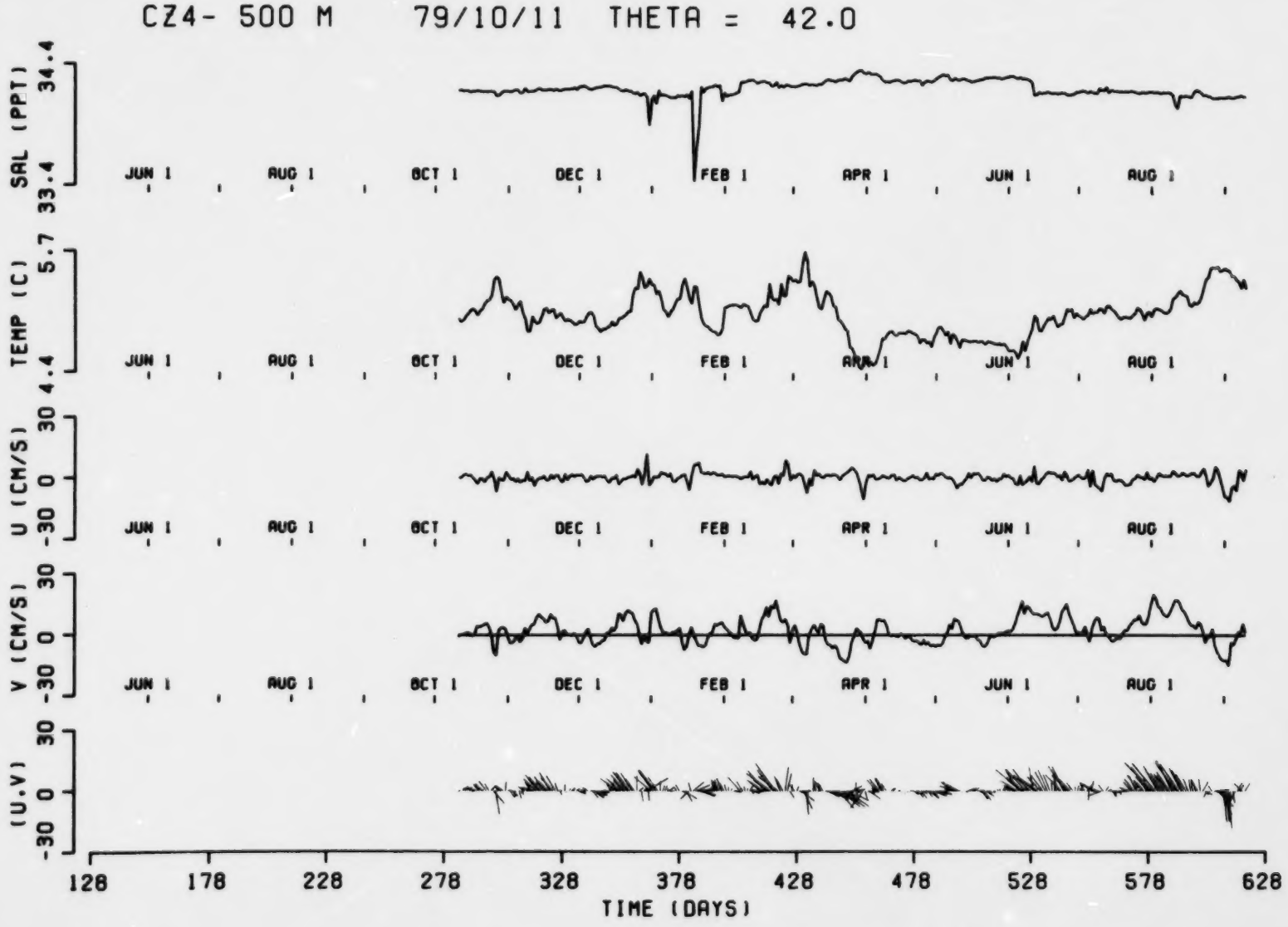

CZ2- 100 M 79/ 5/19 THETA = 70.0
SAL (PPT)
34
32
TEMP (C)
12
6
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)


CZ3- 50 M 79/ 5/20 THETA = 46.0
SAL (PPT)
33
31
TEMP (C)
12
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U.V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)


CZ3- 100 M 79/ 5/20 THETA = 42.0
SAL (PPT)
34
32
TEMP (C)
11
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

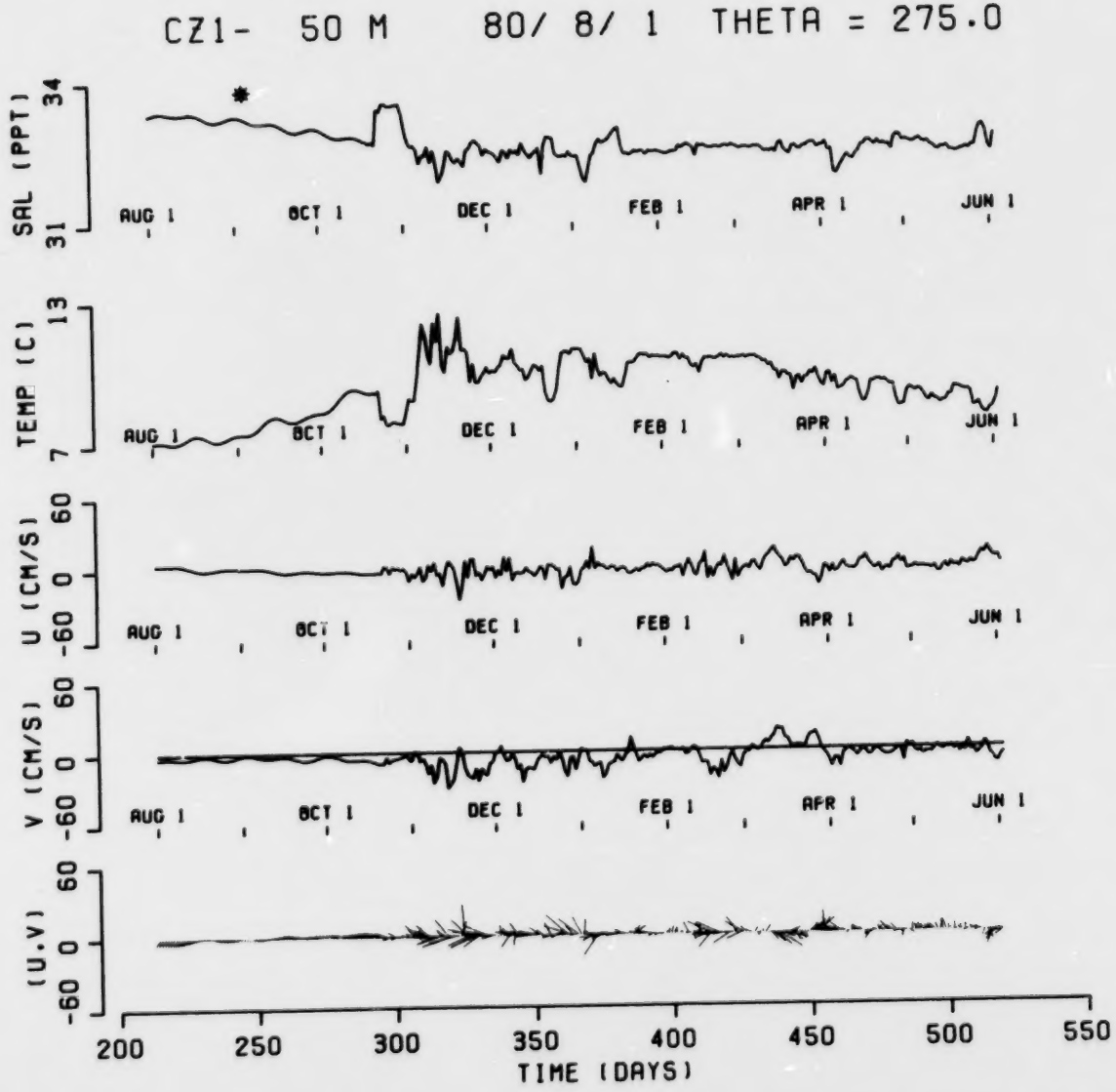

CZ4- 70 M 79/ 5/20 THETA = 35.0
SAL (PPT)
33.5
31.0
TEMP (C)
11
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U.V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

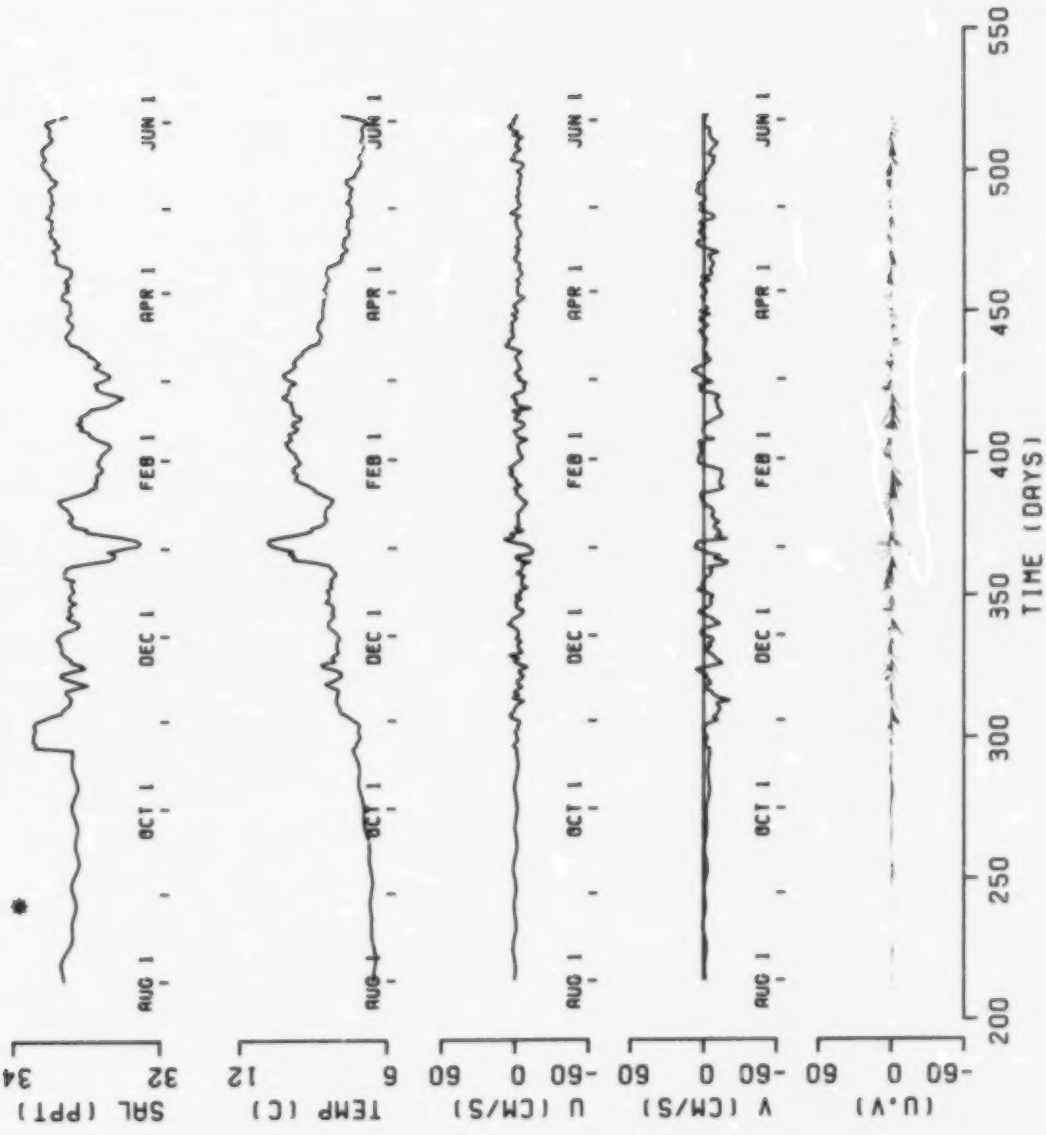

CZ4- 120 M 79/ 5/20 THETA = 39.0
SAL (PPT)
34
32
TEMP (C)
10
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U.V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

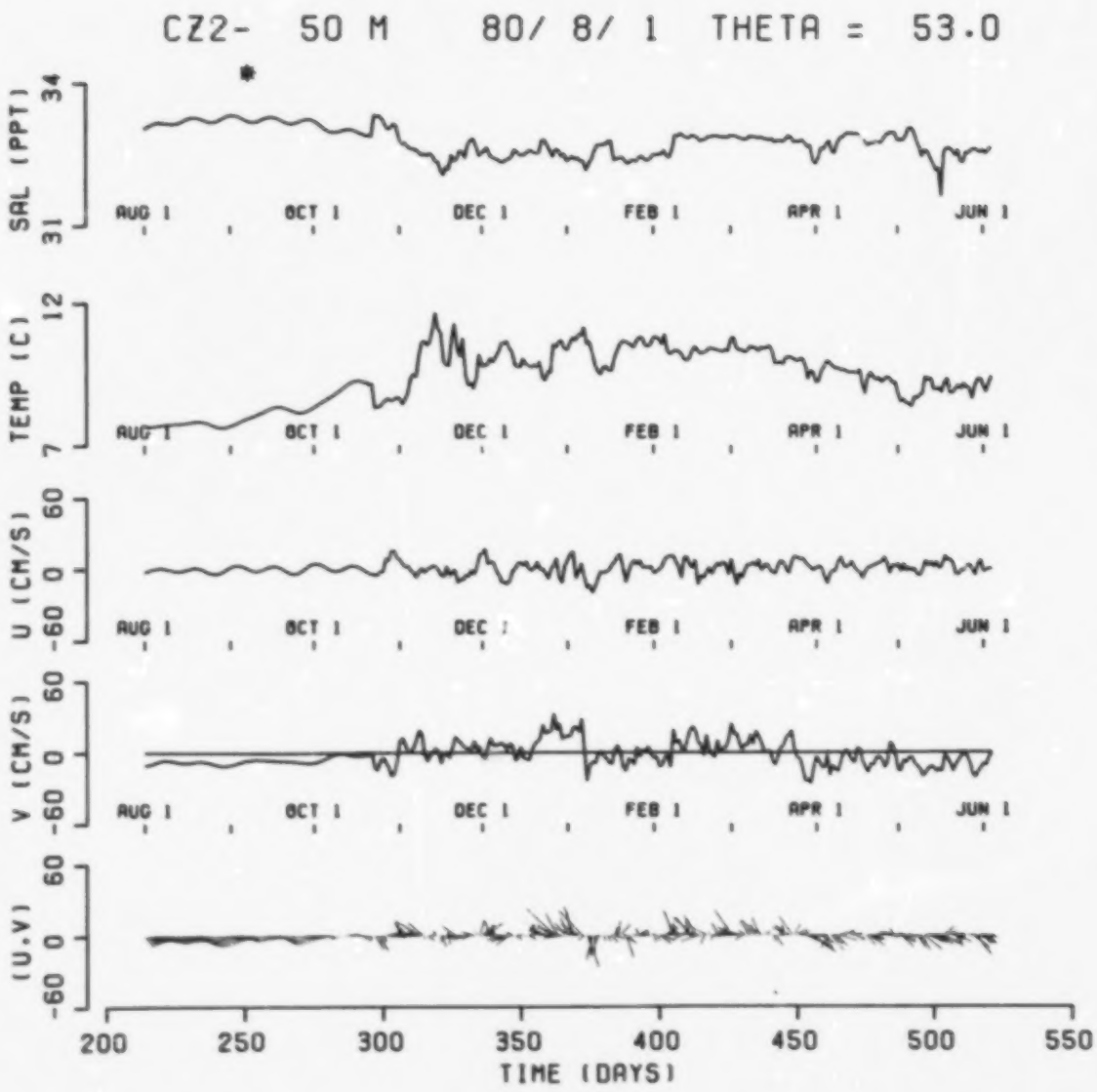

CZ4- 500 M 79/10/11 THETA = 42.0
SAL (PPT)
34.4
33.4
TEMP (C)
5.7
4.4
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U.V)
30
0
-30
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)

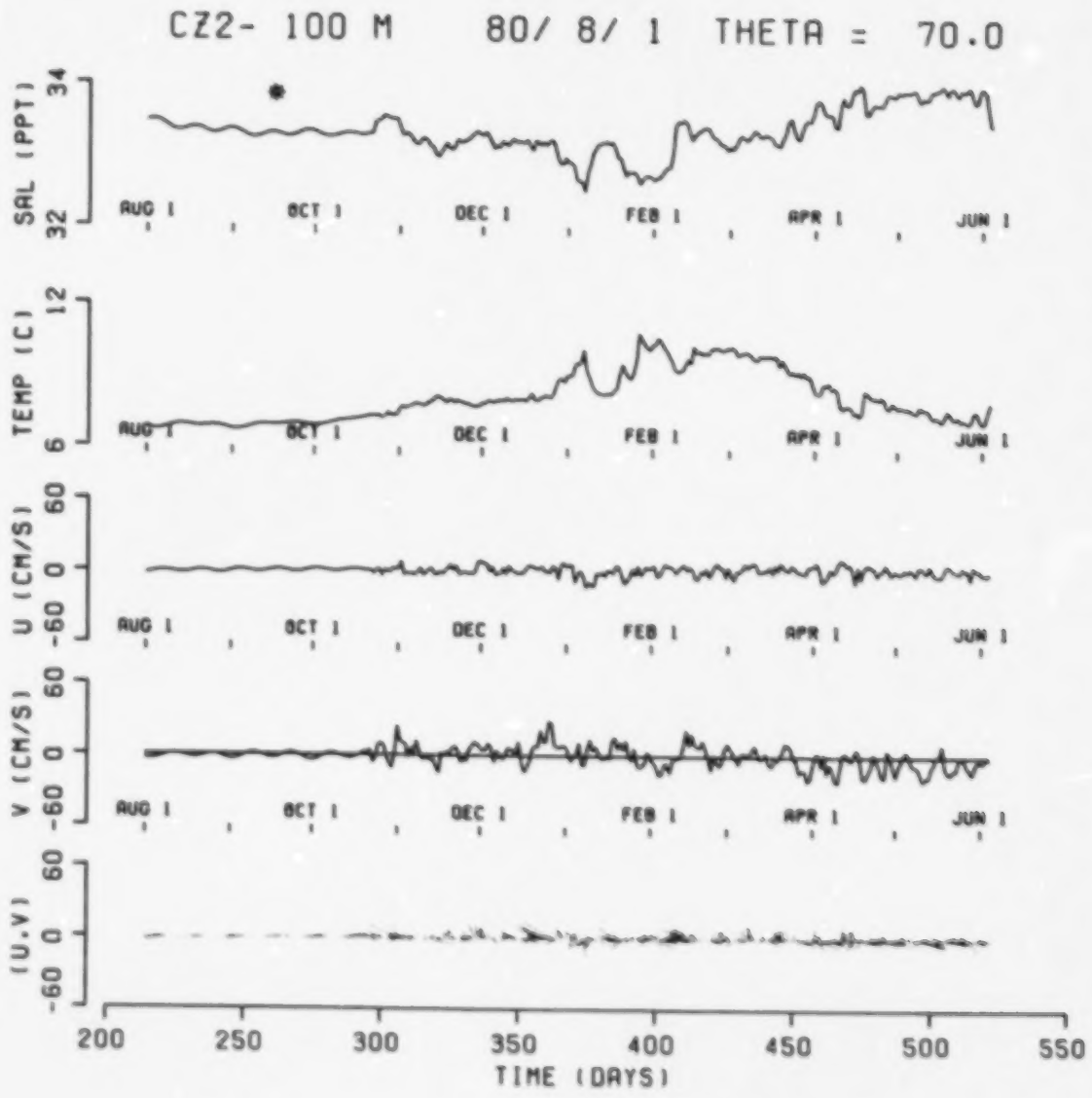
CARMANAH POINT MOORINGS

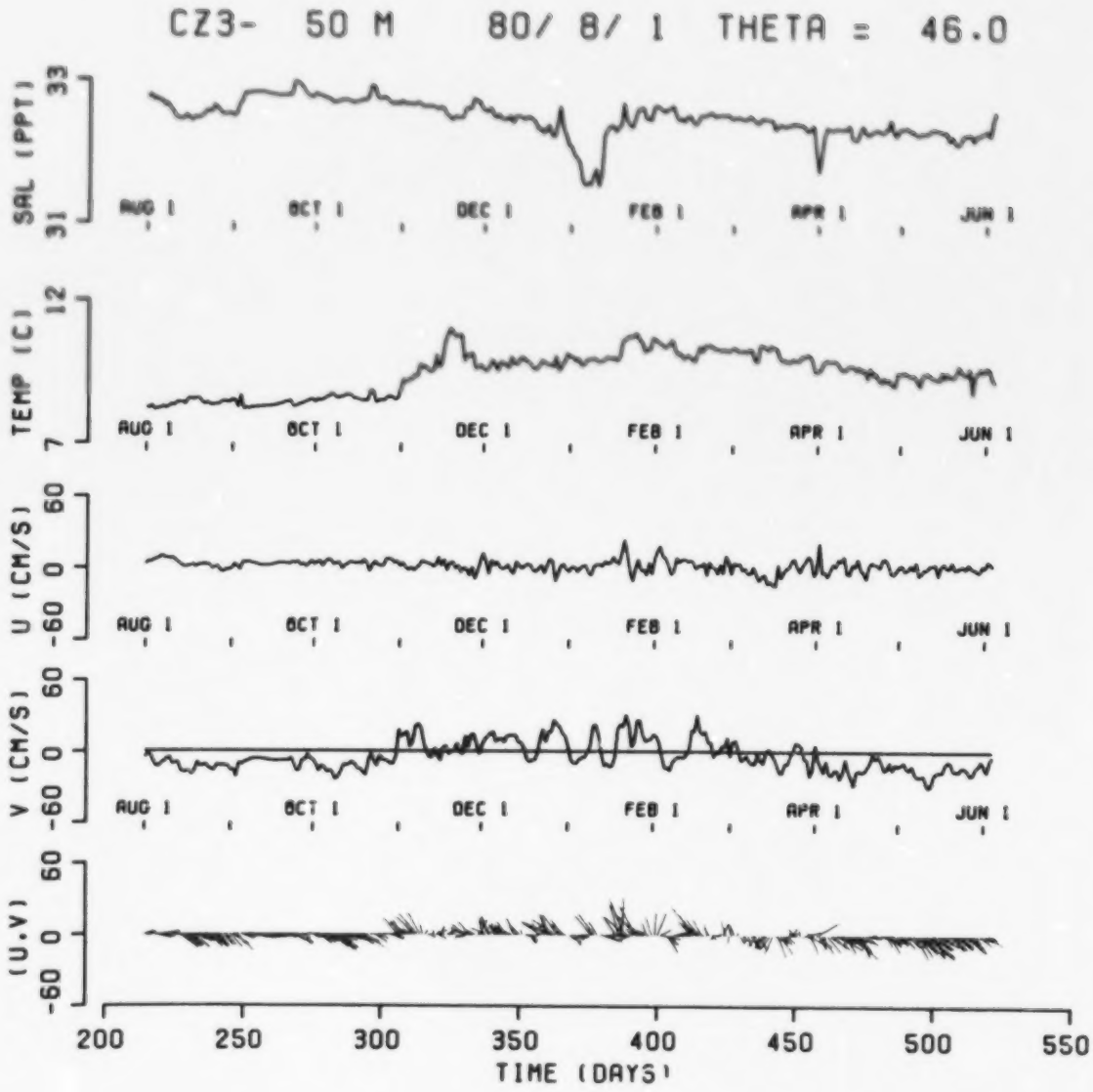
Short Records
Start: 1 August 1980)
(CZ3-200 m starts at 12 June 1980)

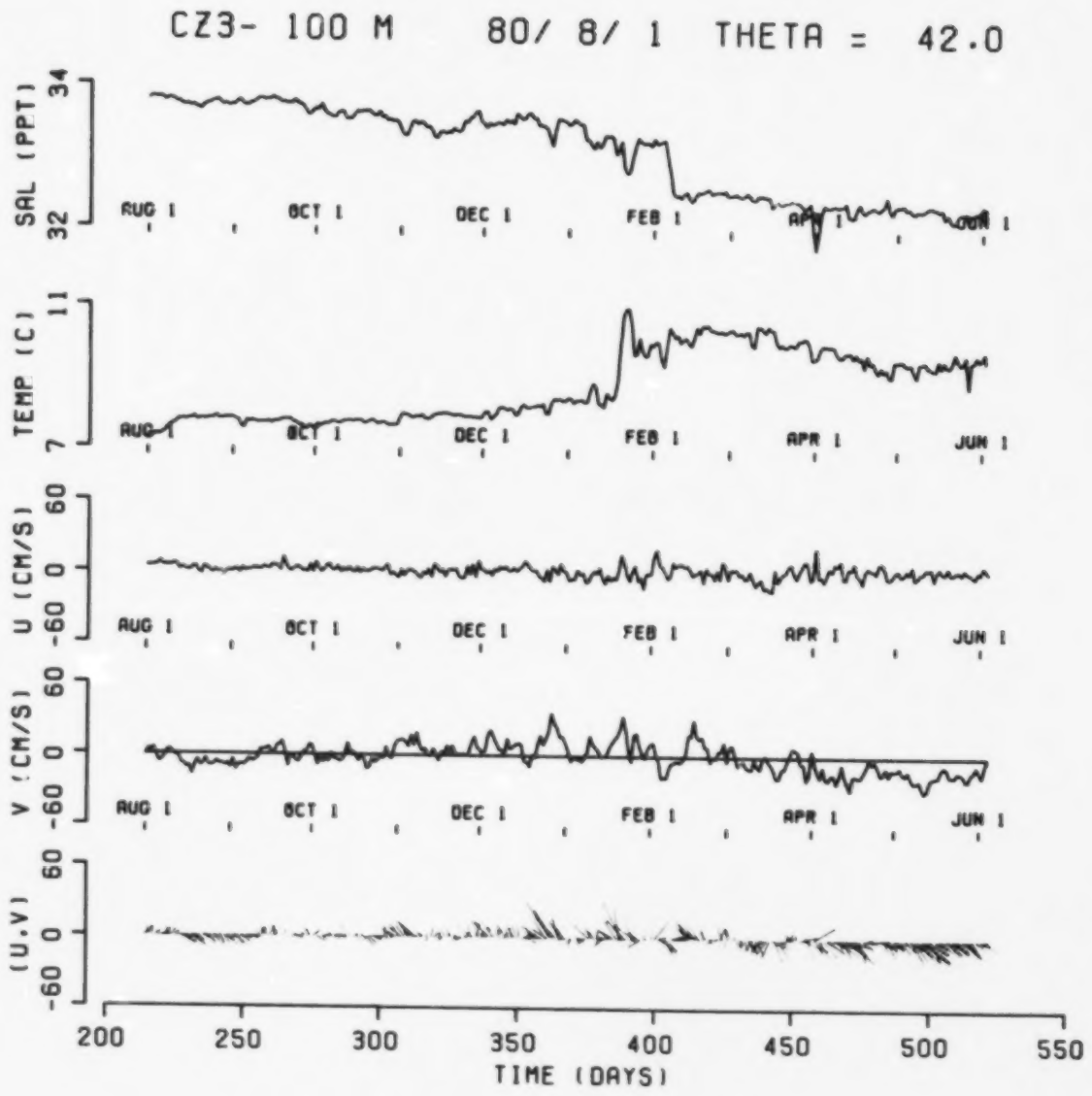

CZ1- 50 M 80/ 8/ 1 THETA = 275.0
SAL (PPT)
34
31
TEMP (C)
13
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U.V)
60
0
-60
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
550
TIME (DAYS)

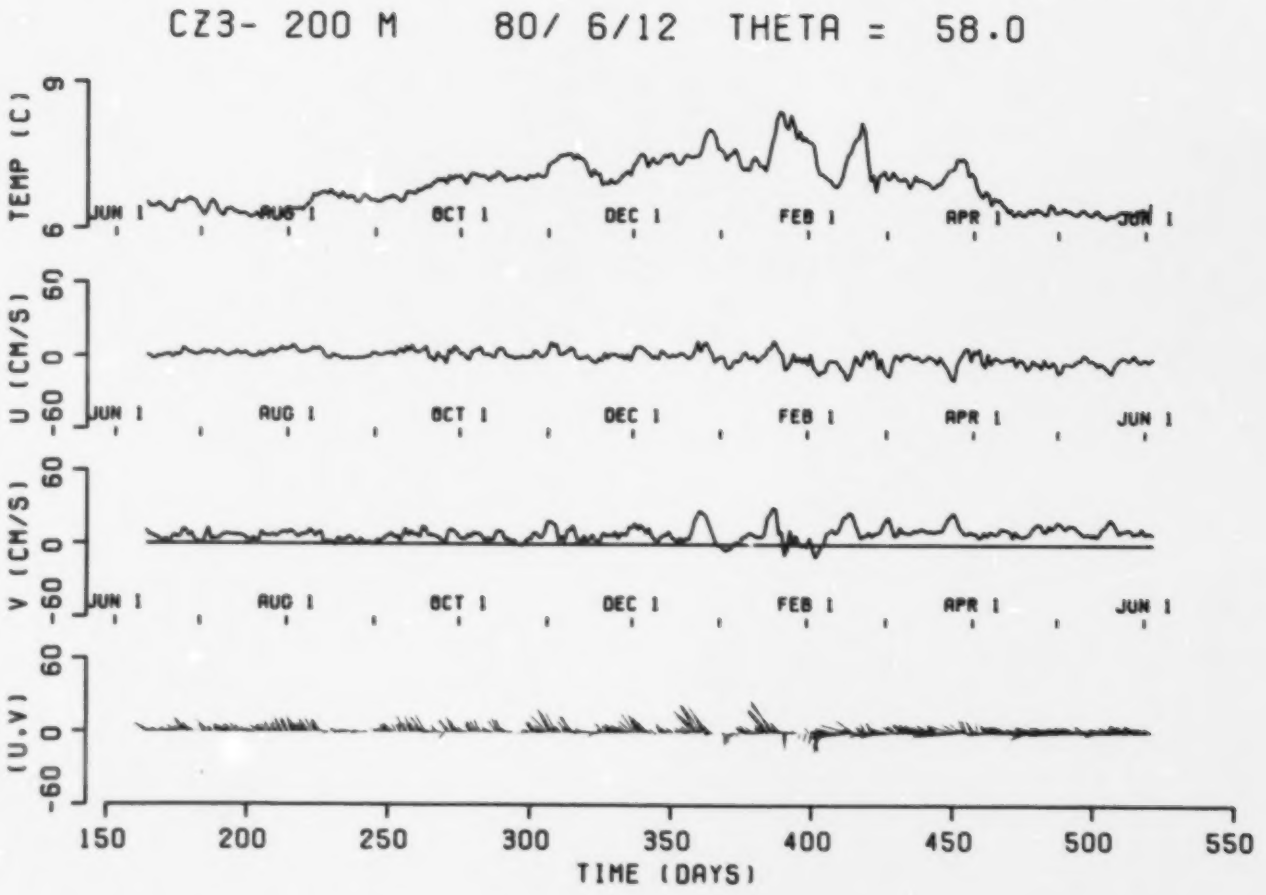

CZ1- 100 M 80/ 8/ 1 THETA = 290.0
SAL (PPT)
32
34
TEMP (C)
6
12
U (CM/S)
-60
0
60
V (CM/S)
-60
0
60
(U.V)
-60
0
60
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
550
TIME (DAYS)

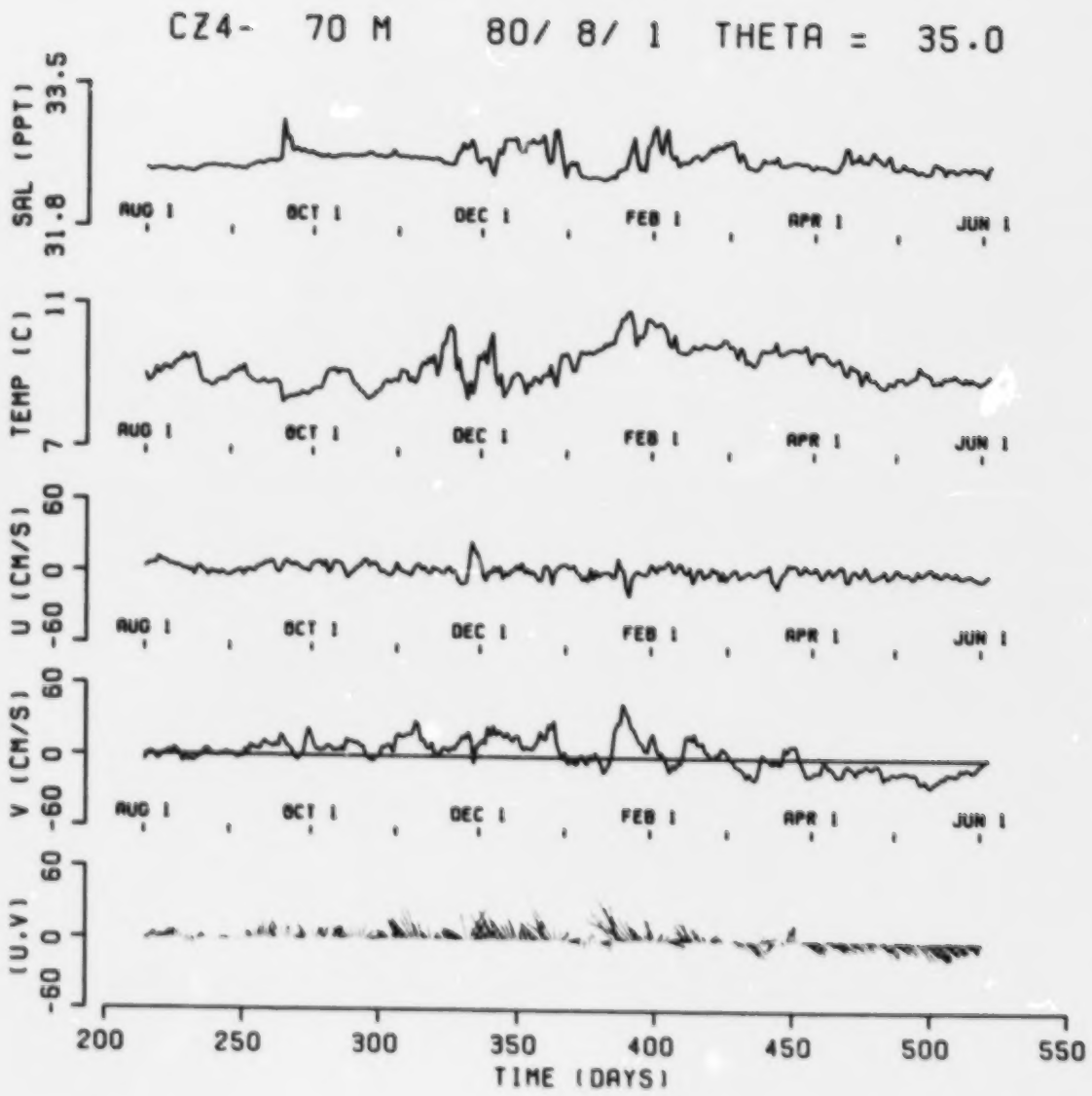

CZ2- 50 M 80/ 8/ 1 THETA = 53.0
SAL (PPT)
34
31
TEMP (C)
12
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
550
TIME (DAYS)

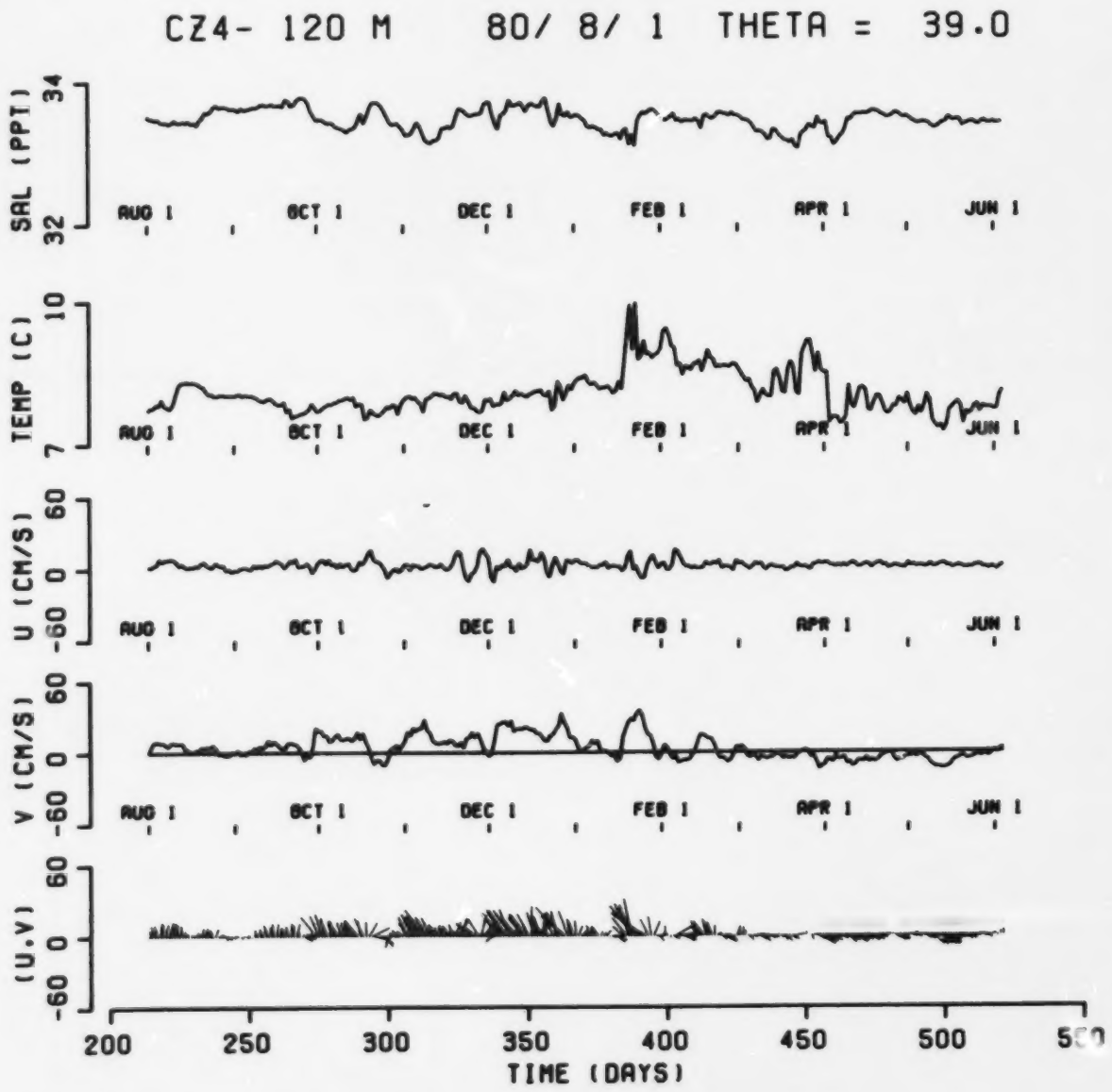

CZ2- 100 M 80/ 8/ 1 THETA = 70.0
SAL (PPT)
34
32
TEMP (C)
12
6
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U.V)
60
0
-60
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
550
TIME (DAYS)

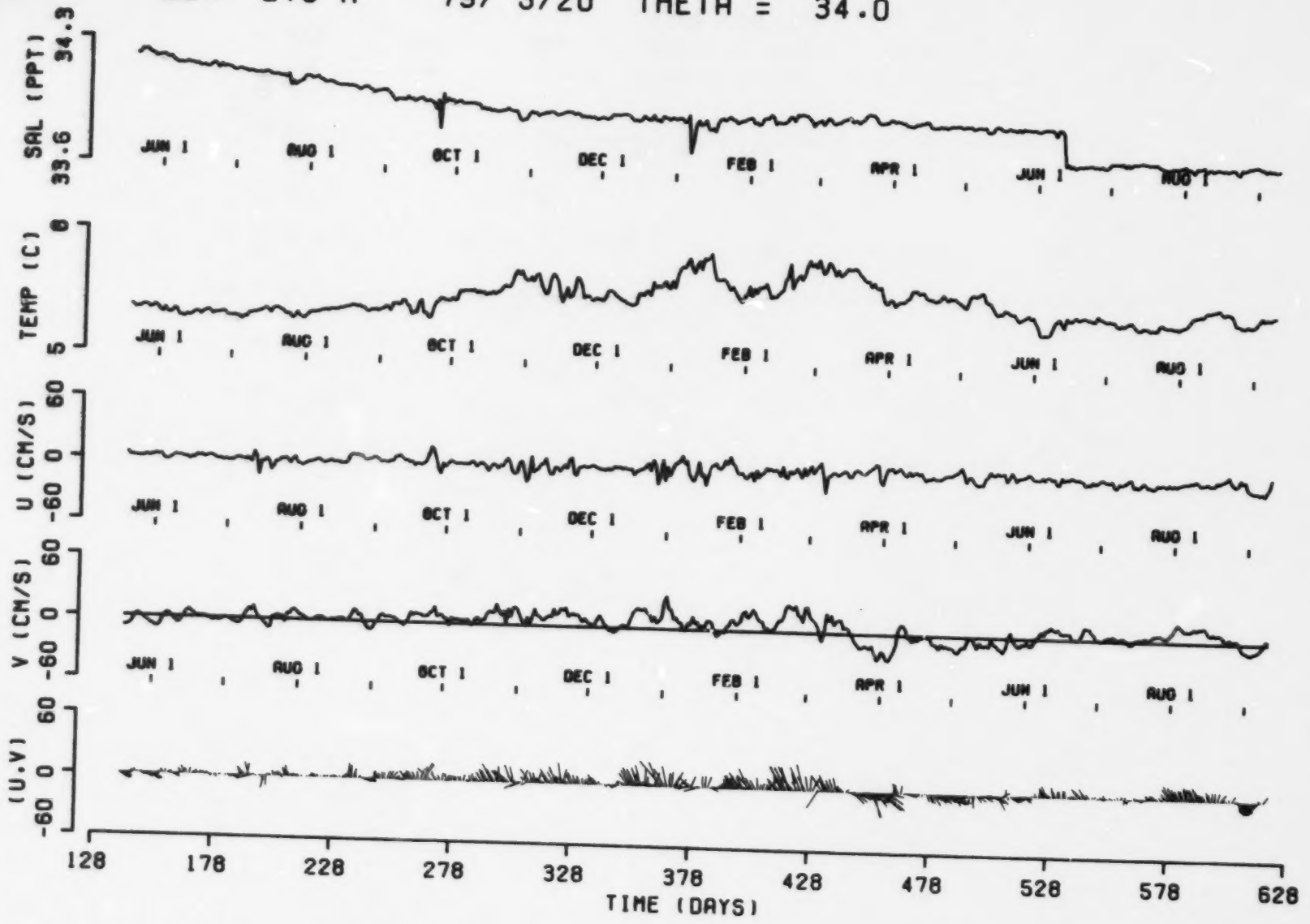

CZ3- 50 M 80/ 8/ 1 THETA = 46.0
SAL (PPT)
33
31
TEMP (C)
12
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
550
TIME (DAYS)

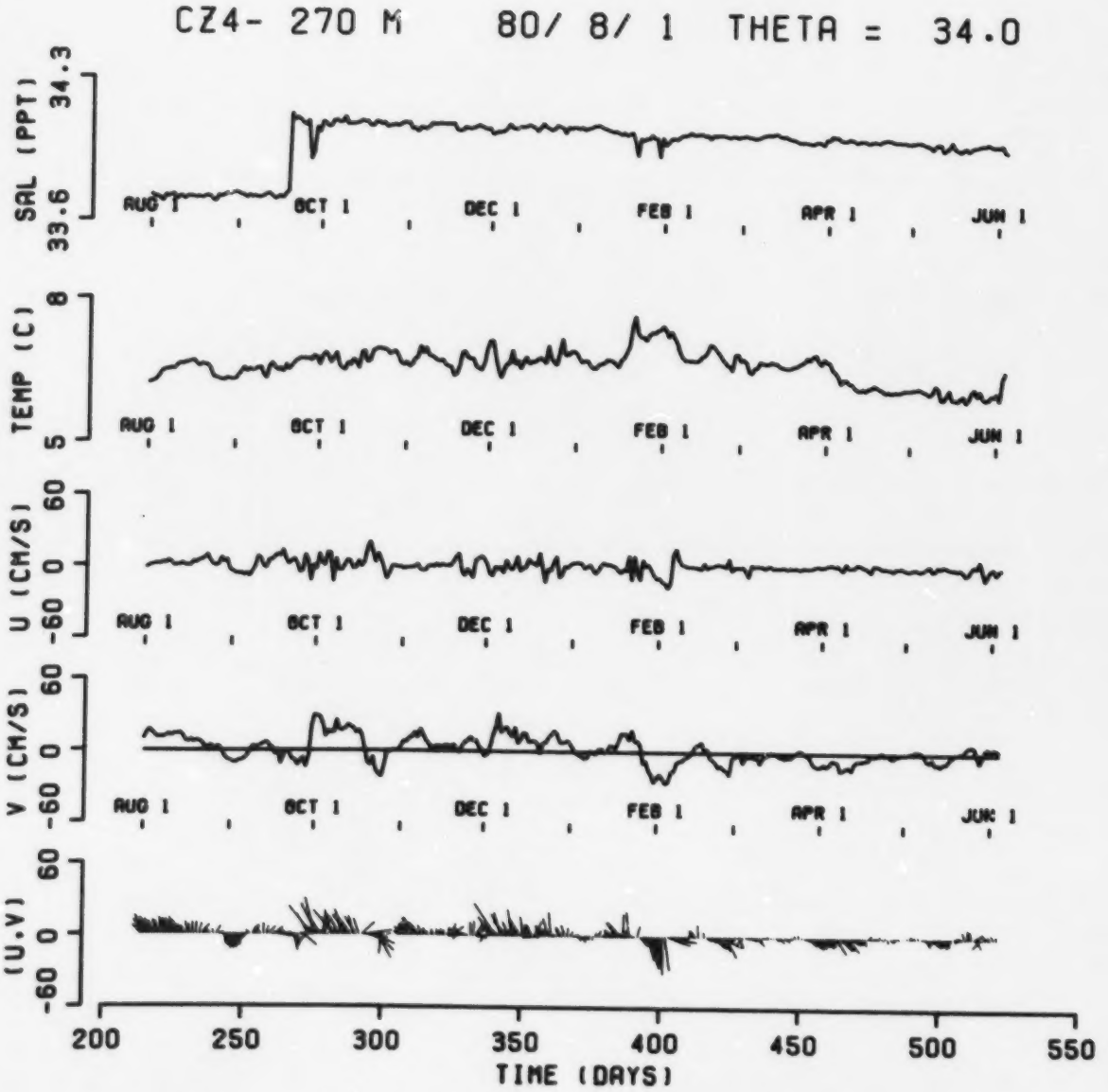

CZ3- 100 M 80/ 8/ 1 THETA = 42.0
SAL (PPT)
34
32
TEMP (C)
11
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
550
TIME (DAYS)

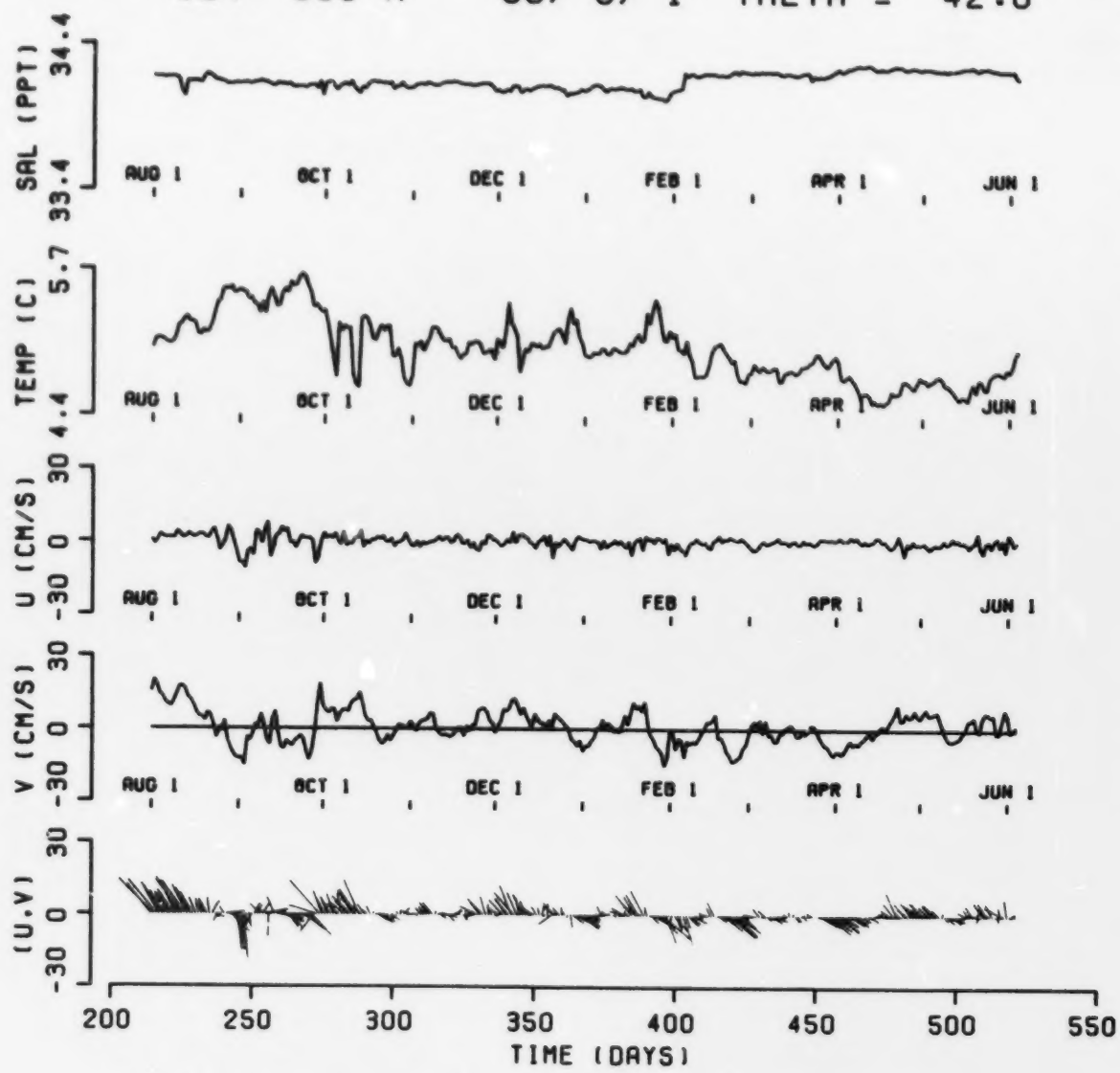

CZ3- 200 M 80/ 6/12 THETA = 58.0
TEMP (C)
9
6
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
U (CM/S)
60
0
-60
V (CM/S)
(U,V)
150
200
250
300
350
400
450
500
550
TIME (DAYS)


CZ4- 70 M 80/ 8/ 1 THETA = 35.0
SAL (PPT)
33.5
31.8
TEMP (C)
11
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
550
TIME (DAYS)


CZ4- 120 M 80/ 8/ 1 THETA = 39.0
SAL (PPT)
34
32
TEMP (C)
10
7
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U,V)
60
0
-60
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
TIME (DAYS)


CZ4- 270 M 79/ 5/20 THETA = 34.0
SAL (PPT)
34.3
33.6
TEMP (C)
6
5
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U.V)
60
0
-60
JUN 1
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
AUG 1
128
178
228
278
328
378
428
478
528
578
628
TIME (DAYS)


CZ4- 270 M 80/ 8/ 1 THETA = 34.0
SAL (PPT)
34.3
33.6
TEMP (C)
8
5
U (CM/S)
60
0
-60
V (CM/S)
60
0
-60
(U.V)
60
0
-60
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
550
TIME (DAYS)


CZ4- 500 M 80/ 8/ 1 THETA = 42.0
SAL (PPT)
34.4
33.4
TEMP (C)
5.7
4.4
U (CM/S)
30
0
-30
V (CM/S)
30
0
-30
(U,V)
30
0
-30
AUG 1
OCT 1
DEC 1
FEB 1
APR 1
JUN 1
200
250
300
350
400
450
500
550
TIME (DAYS)

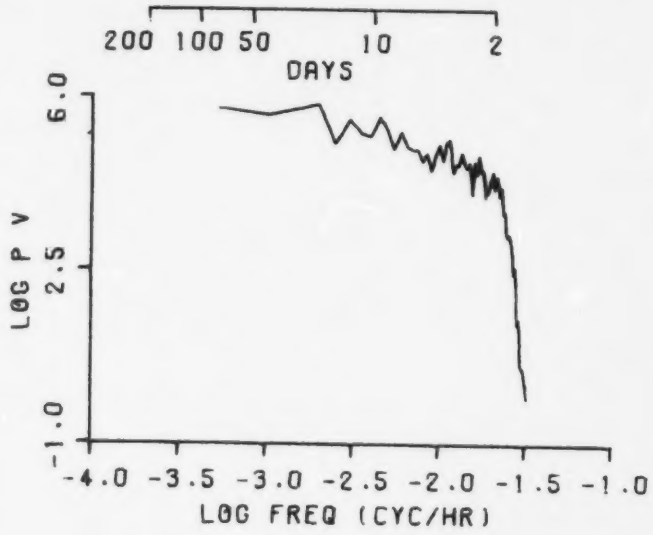
APPENDIX B

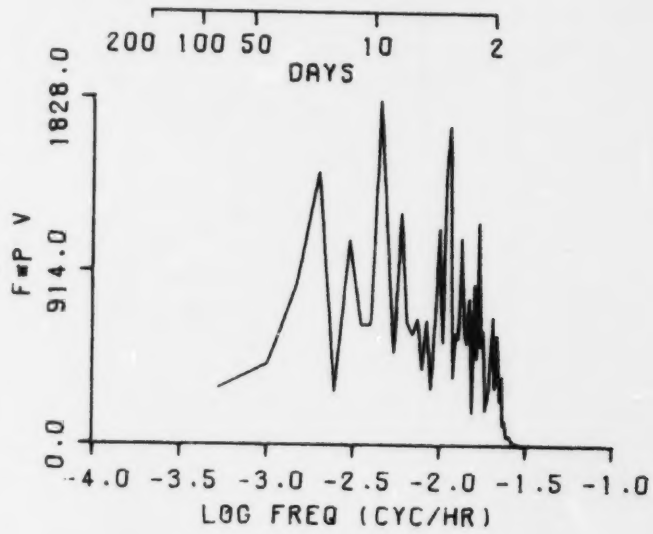
This section contains spectra of the across (u) and alongshore (v) wind and current velocity records. The 'Header' gives the station location, depth in metres, start date (Year/Month/Day) and the orientation of the principal axes, counterclockwise to north. The bandwidth in all cases is 0.005 cph* and there are generally in excess of 7 degrees of freedom per band. Log PV = logarithm of Power (P) for the v-component; Log PU = logarithm of Power (P) for u-component. P = $(m/s)^2$/cph for wind and $(cm/s)^2$/cph for current. F = frequency in cycles per hour.

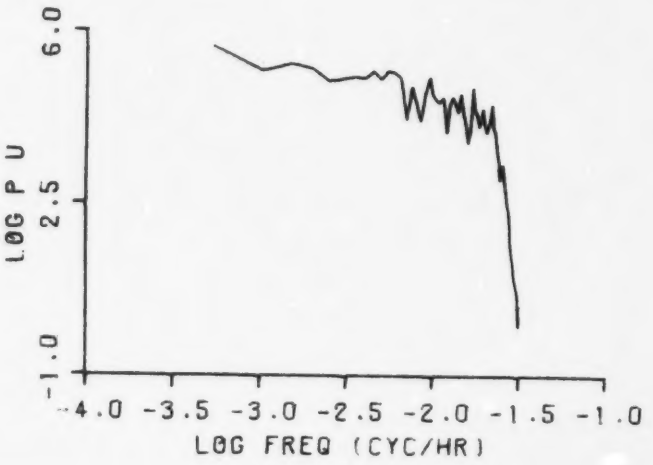
The first spectra (BAK) are of the along and across-shore components of surface winds derived by Andrew Bakun (NMFS). Remaining spectra are for current velocity.

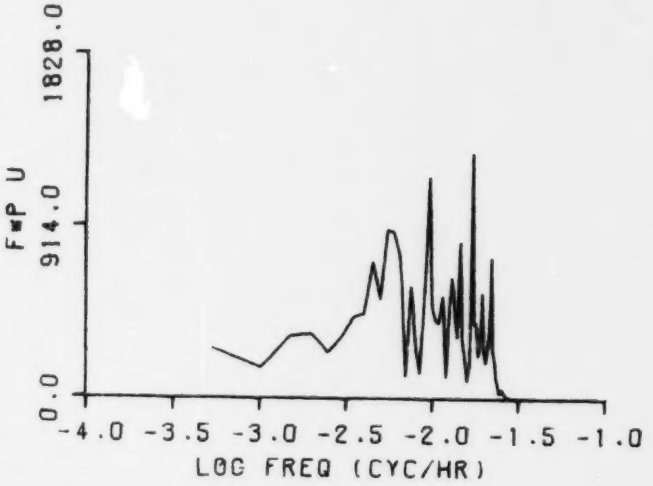
*cph = cycles per hour

BAK- 0 M 79/ 5/ 1/ 0 THETA = .0

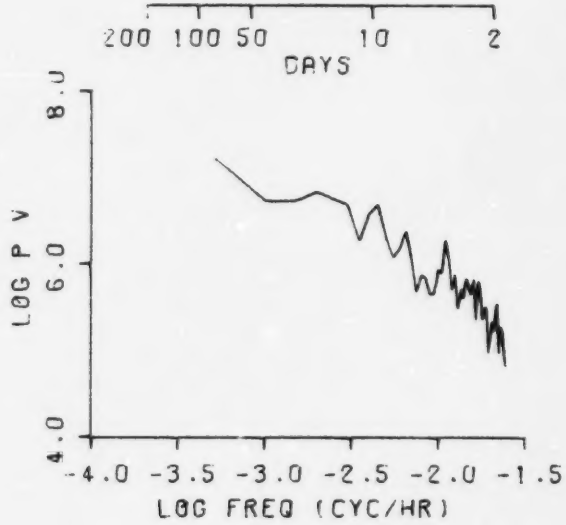


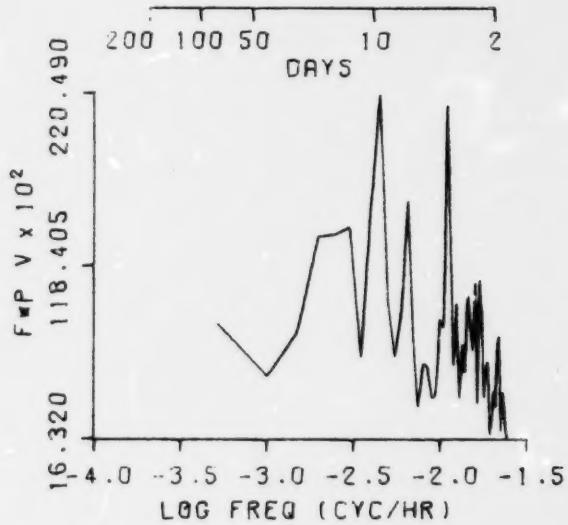


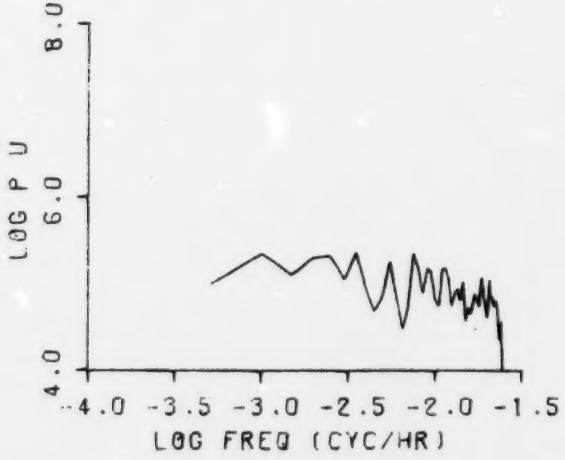


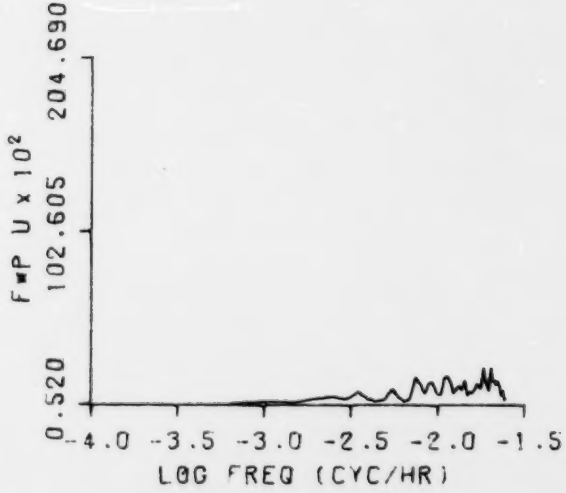


B01- 53 M 79/ 9/18/11 THETA = 36.0

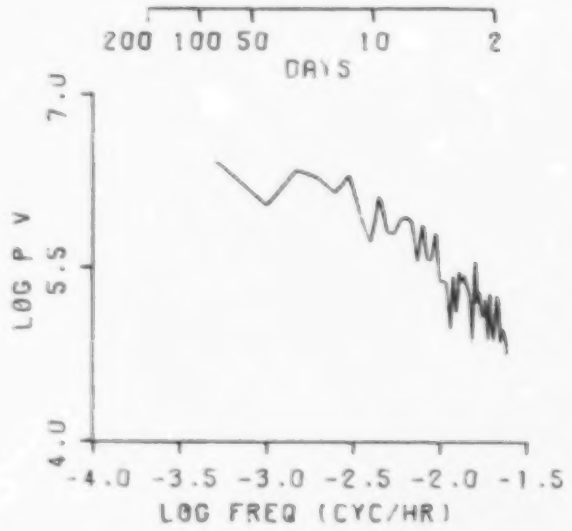


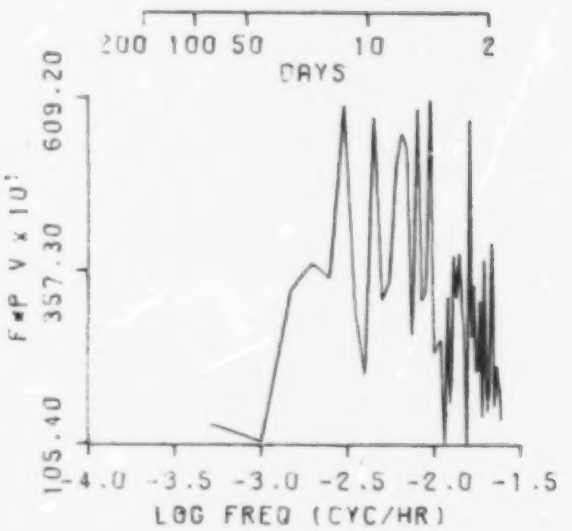


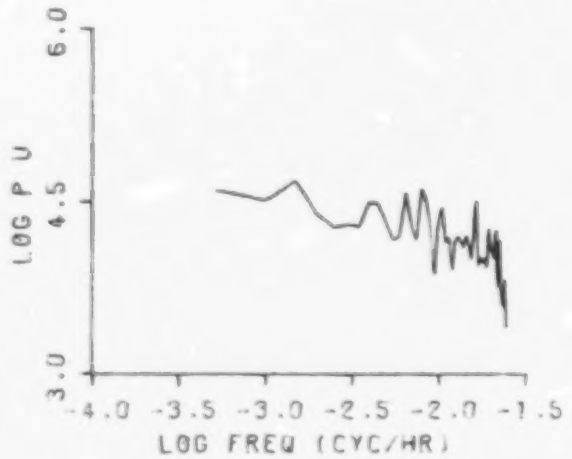


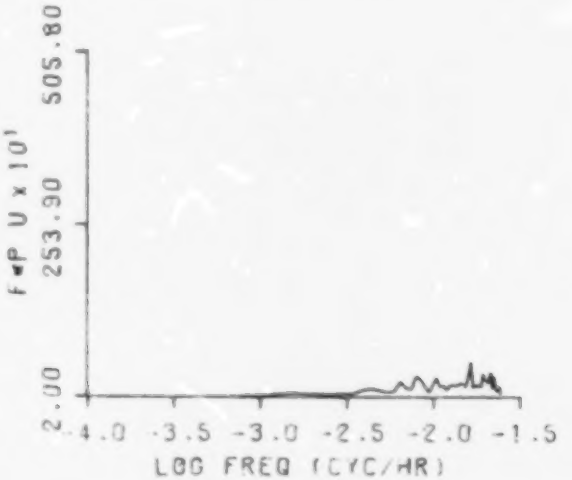


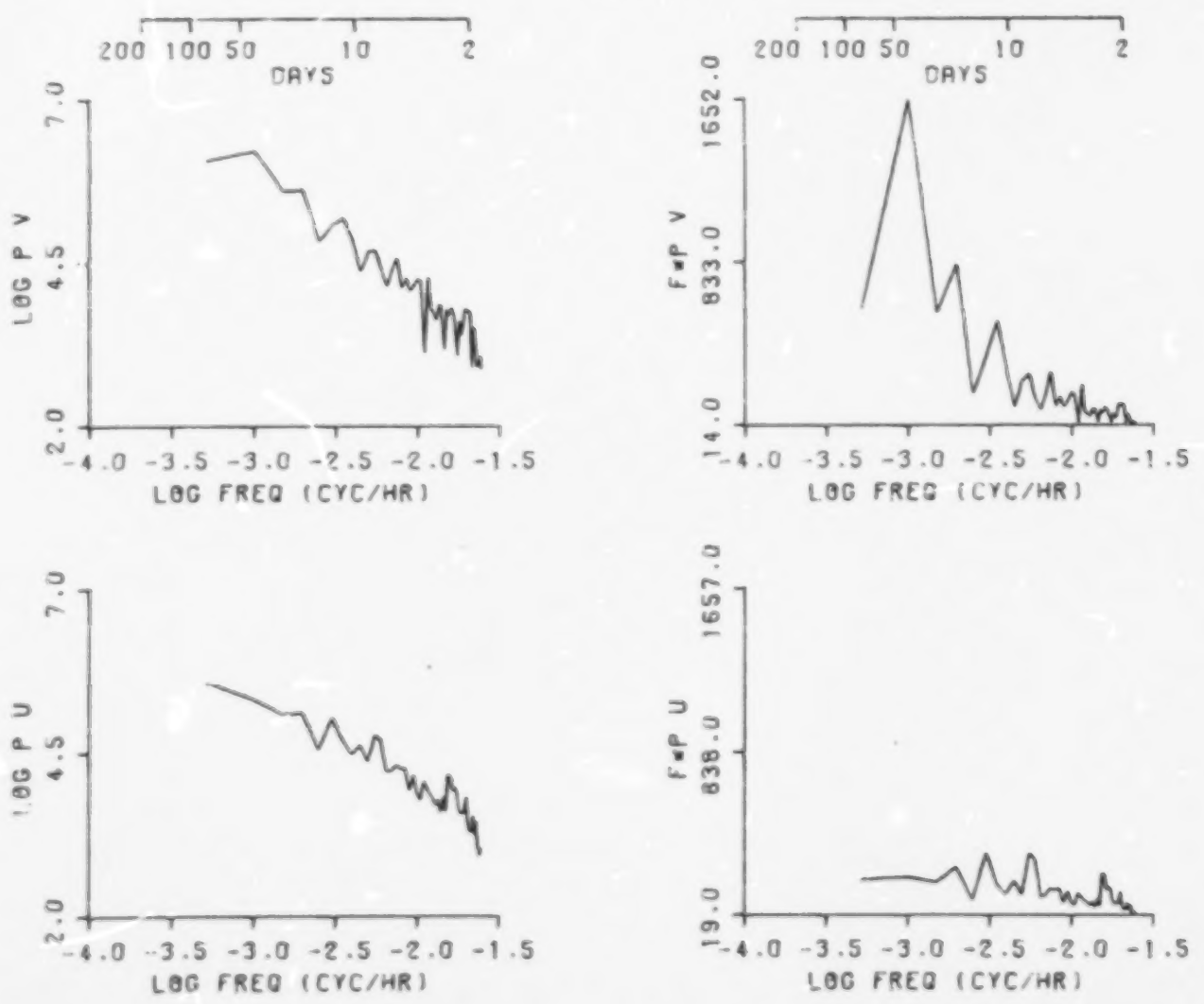
B01- 113 M 73/ 5/11/19 THETA = 43.0



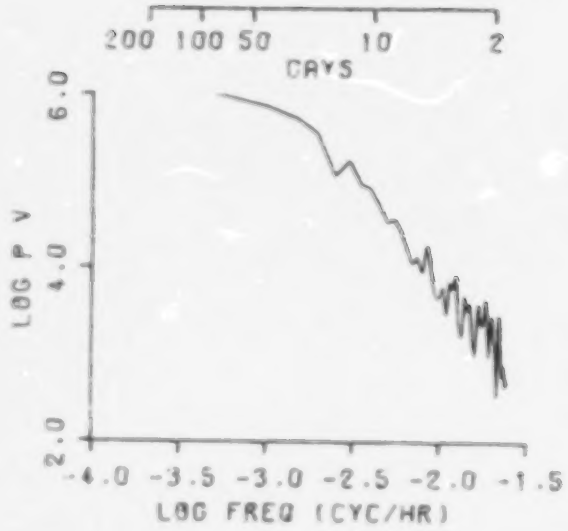


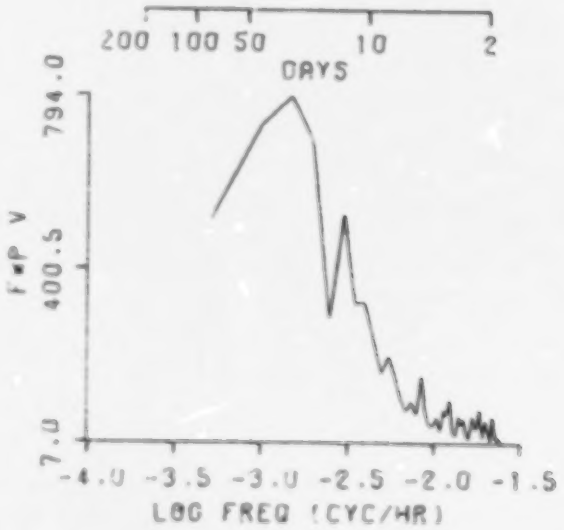


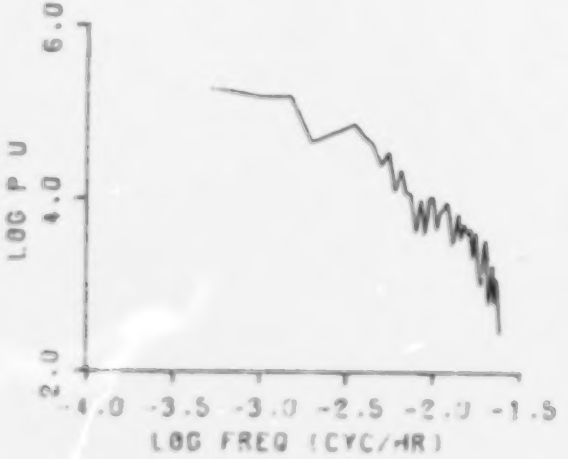


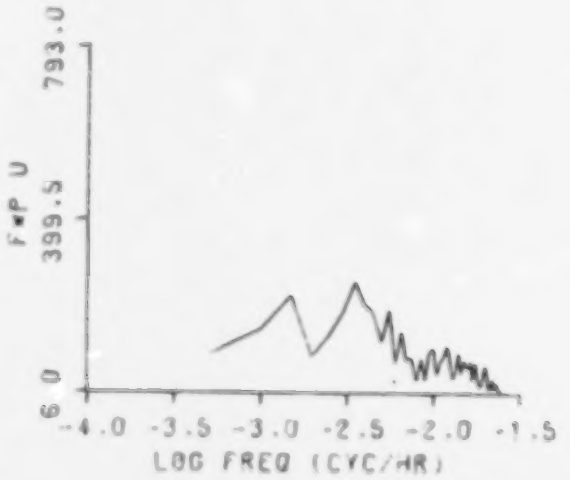

802- 475 M 79/ 9/23/13 THETA = 36.0
200 100 50 10 2
DAYS
LOG P V
7.0
4.5
2.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V
1652.0
833.0
14.0
LOG P U
F*P U
1657.0
838.0
19.0

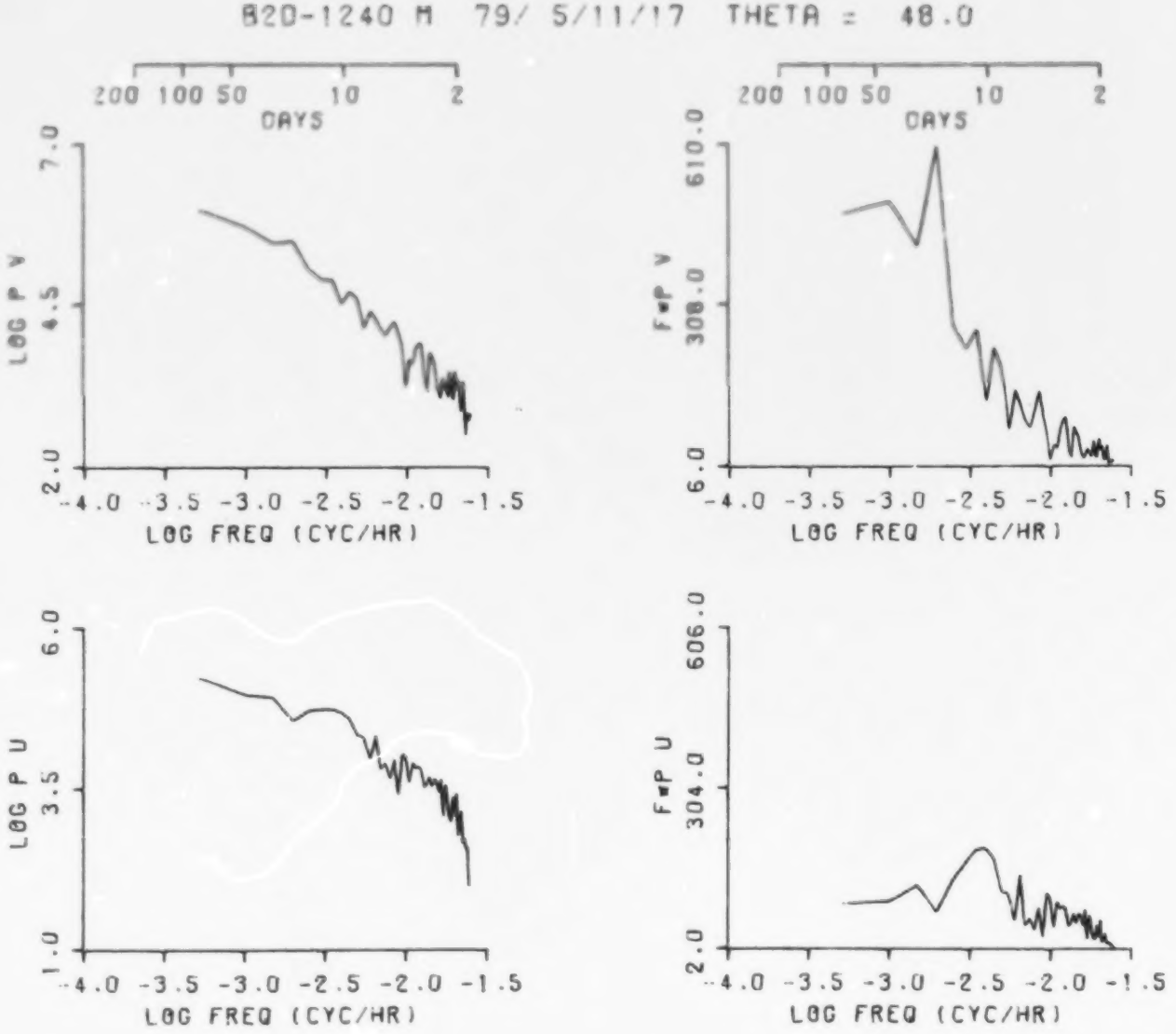
B20- 740 M 79/ 5/11/17 THETA = 41.0



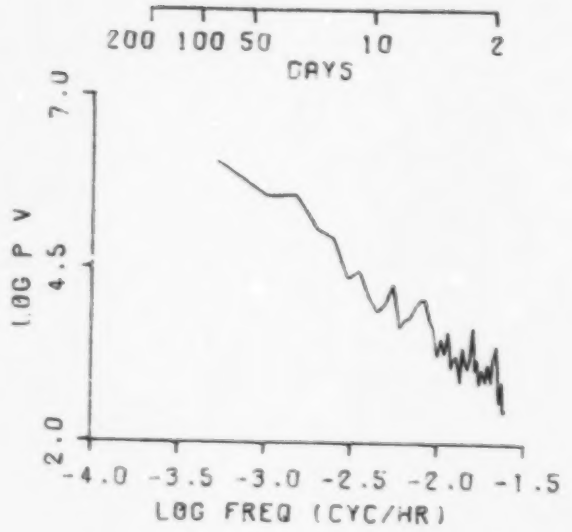


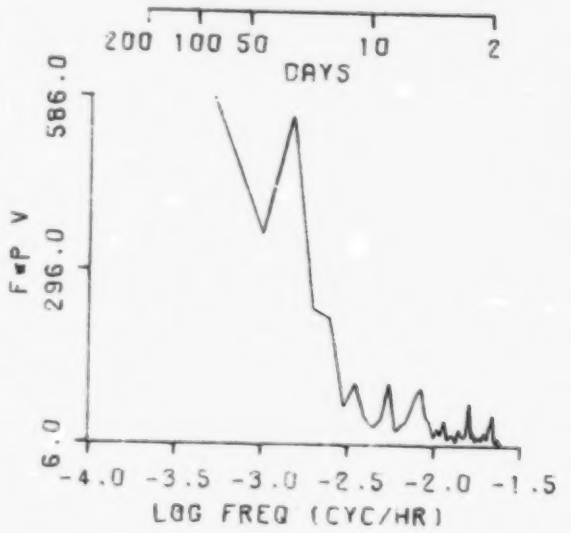


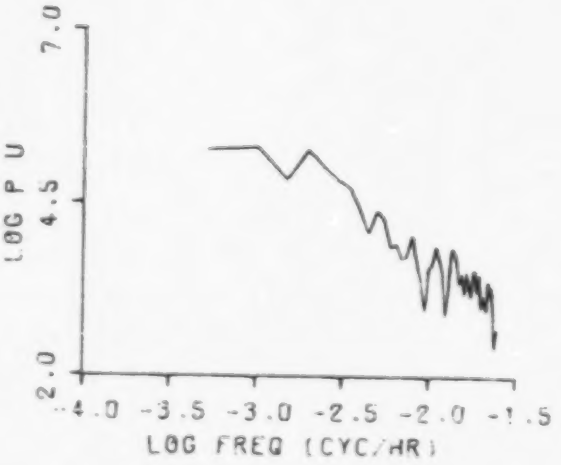


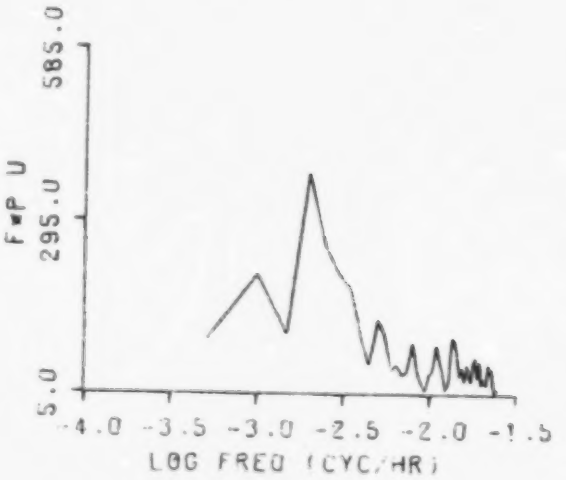

B2D-1240 M 79/ 5/11/17 THETA = 48.0
200 100 50 10 2
DAYS
LOG P V
7.0
4.5
2.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V
610.0
308.0
6.0
LOG P U
6.0
3.5
1.0
F*P U
606.0
304.0
2.0

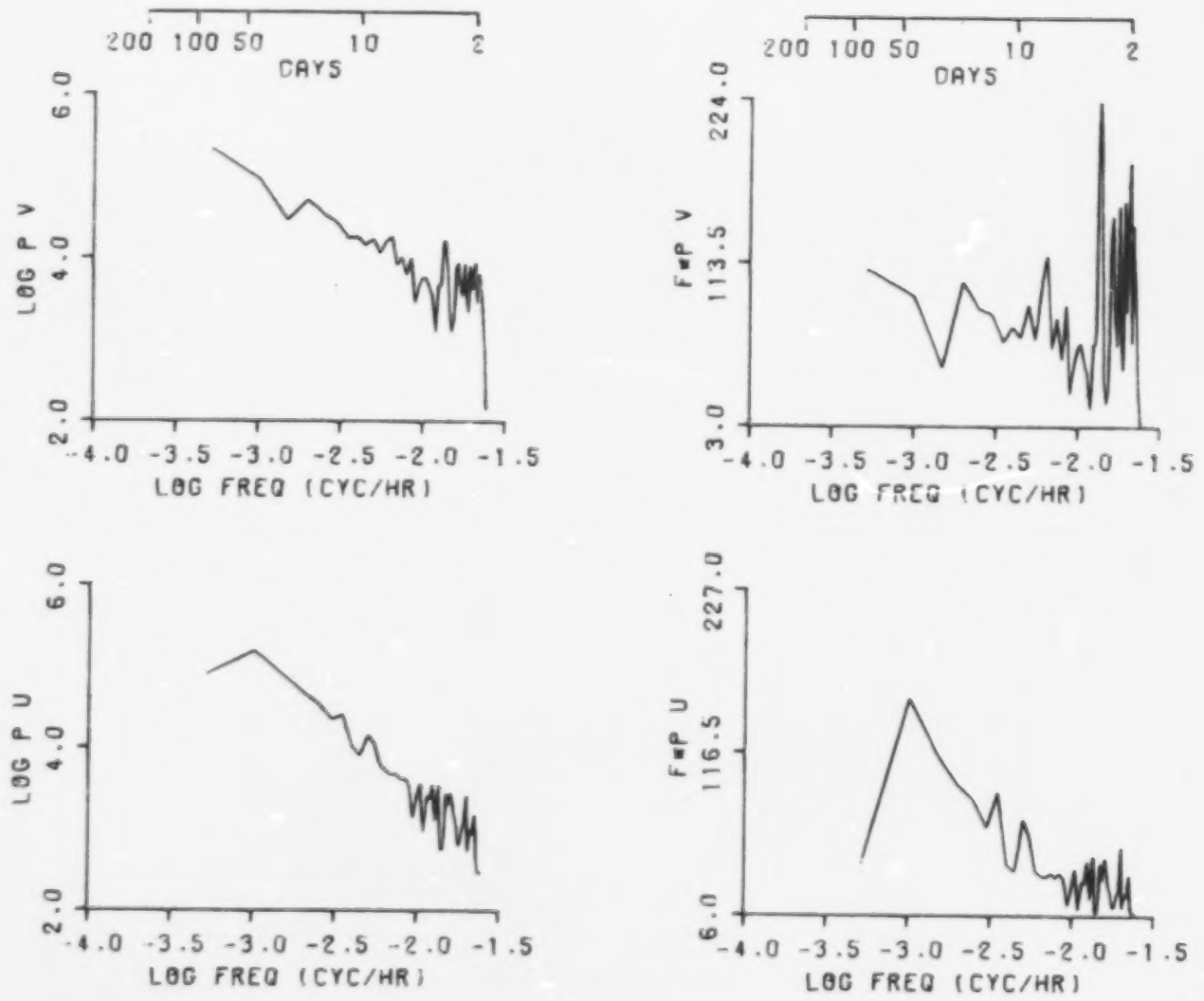
B03- 465 M 79/ 5/11/13 THETA = 88.0



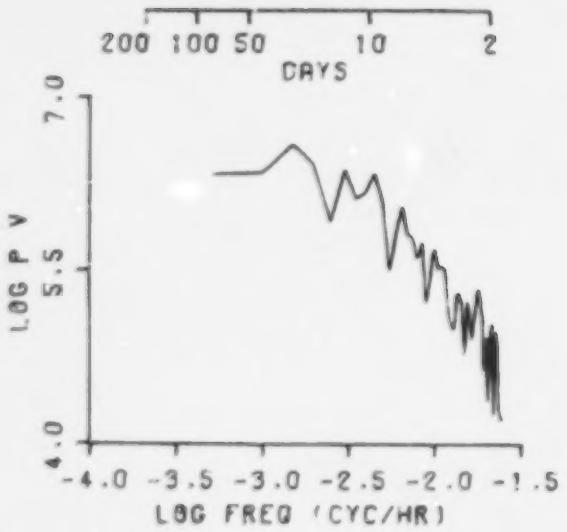


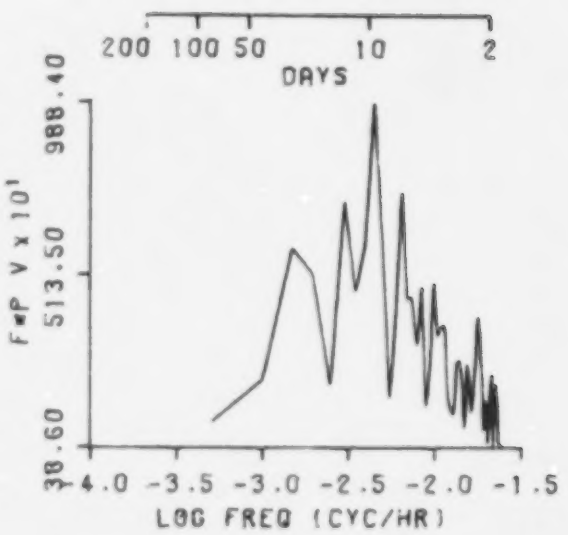


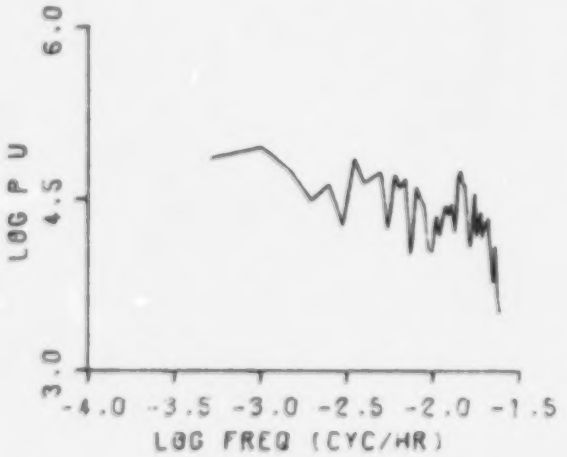


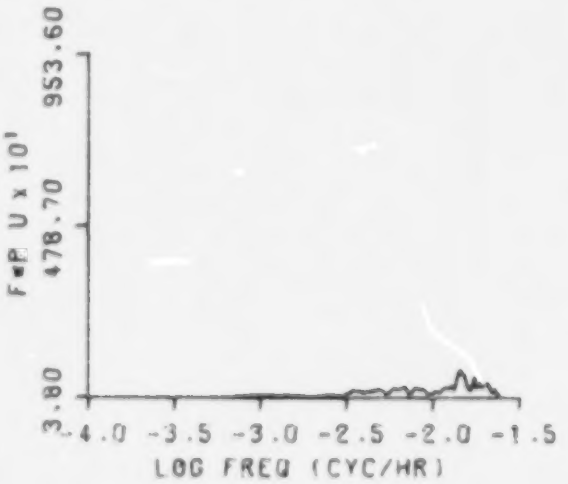

B03- 965 M 79/ 5/11/13 THETA = 61.0
200 100 50 10 2
DAYS
LOG P V
6.0
4.0
2.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
200 100 50 10 2
DAYS
F*P V
224.0
113.5
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
LOG P U
6.0
4.0
2.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P U
227.0
116.5
6.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)

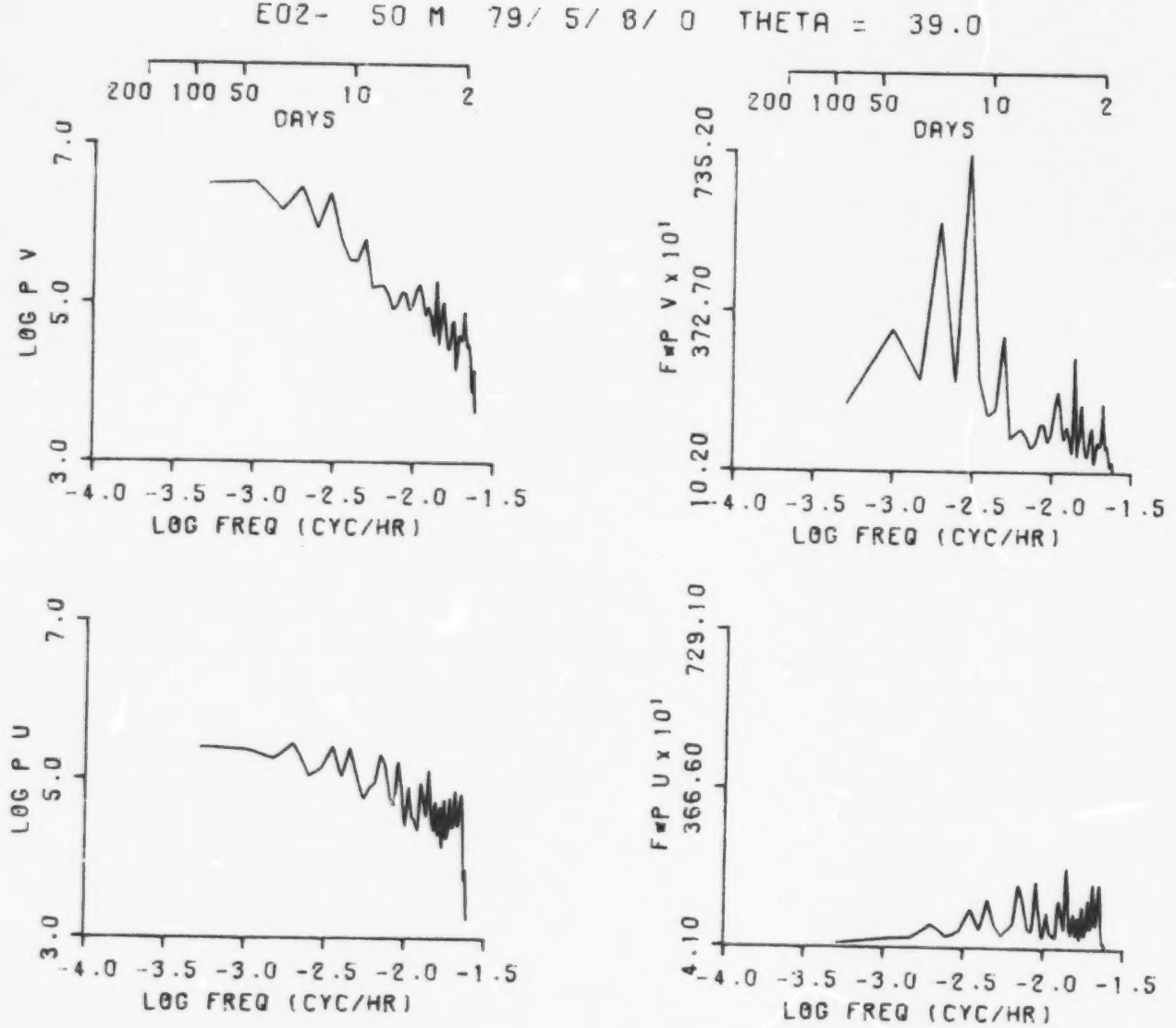
EQ1- 89 M 79/ 5/ 7/16 THETA = 44.0



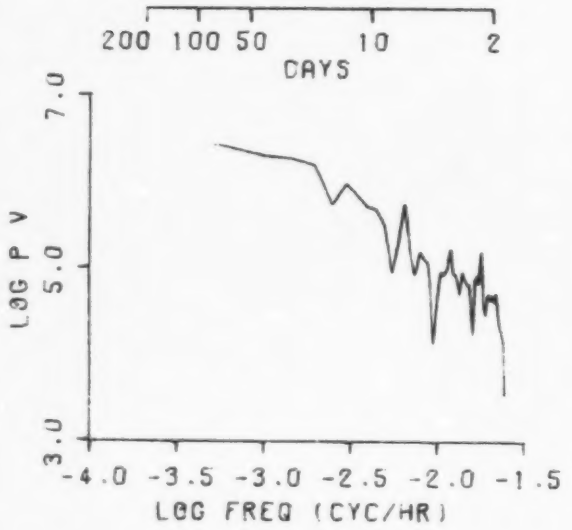


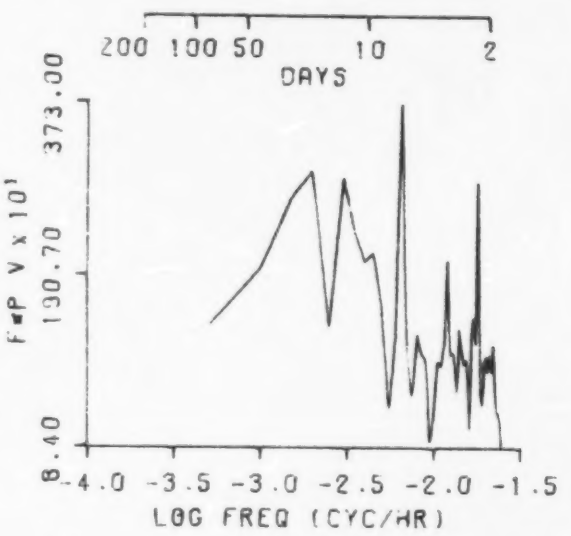


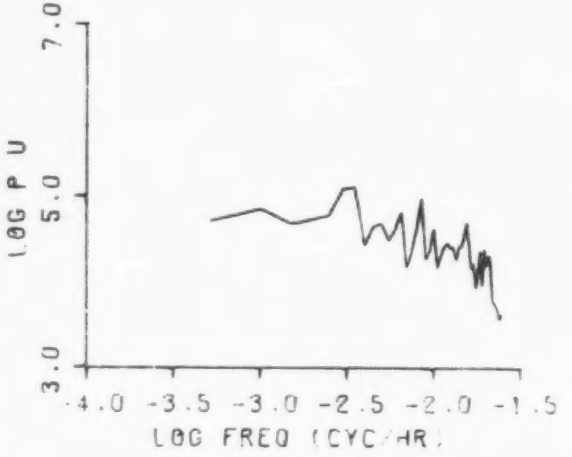


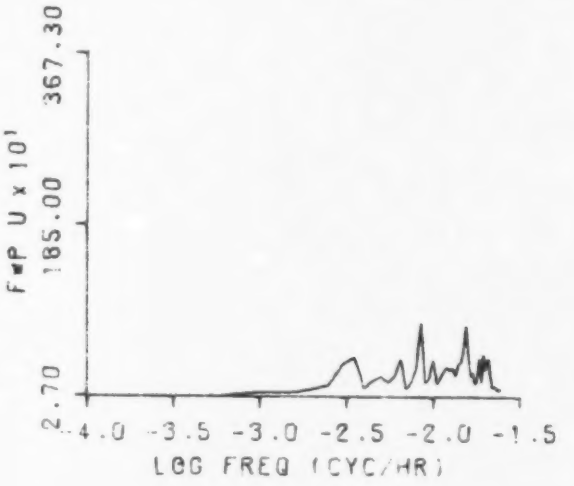

E02- 50 M 79/ 5/ 8/ 0 THETA = 39.0
200 100 50 10 2
DAYS
LOG P V
7.0
5.0
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V x 10¹
735.20
372.70
10.20
LOG P U
F*P U x 10¹
729.10
366.60
4.10

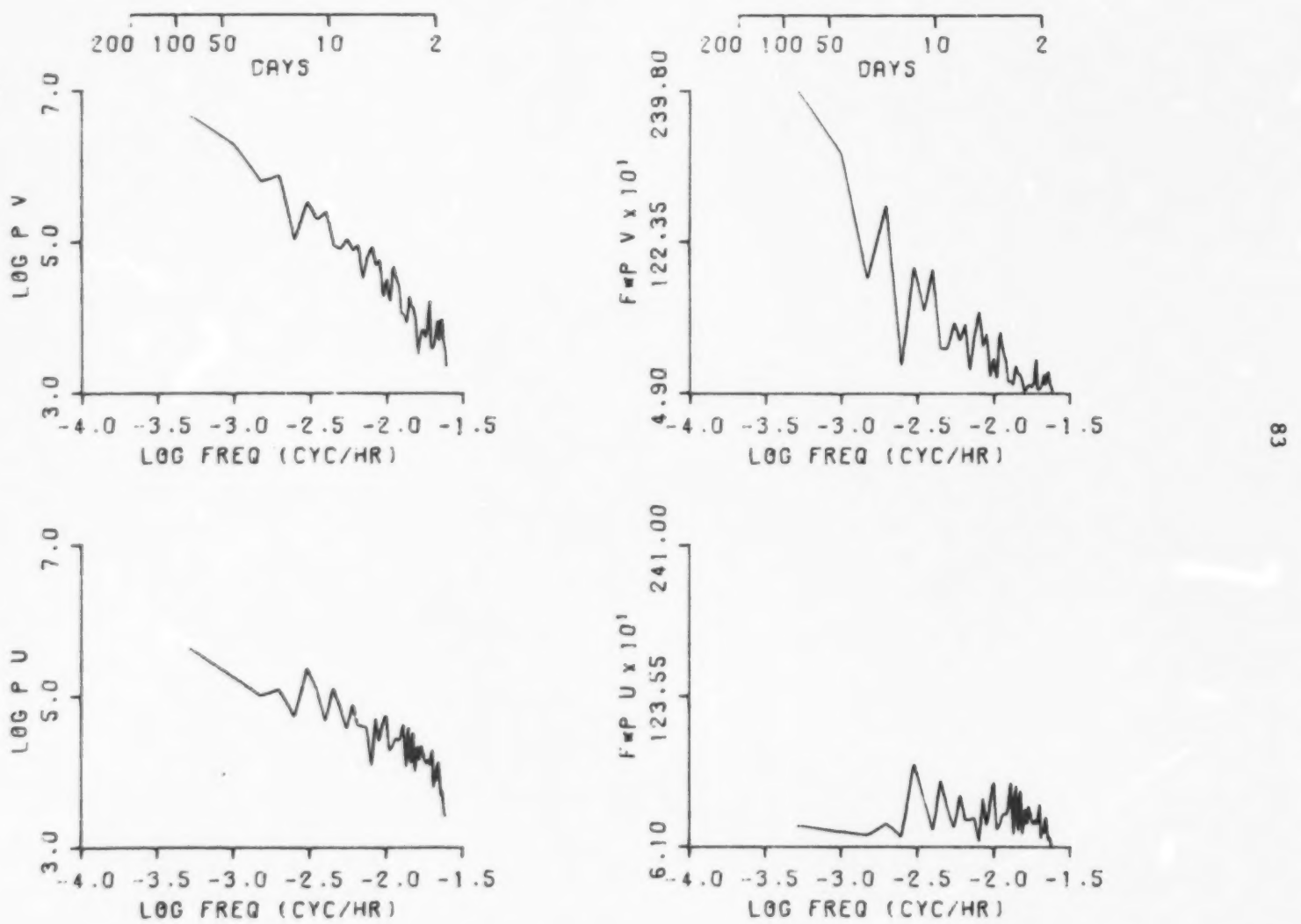
E02- 100 M 79/ 5/ 7/20 THETA = 44.0



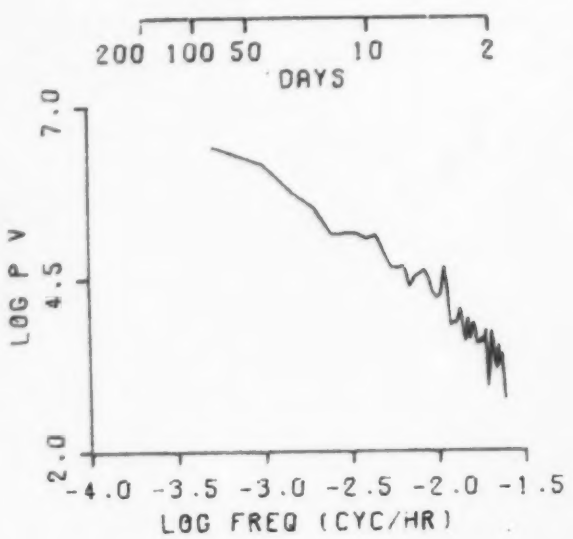


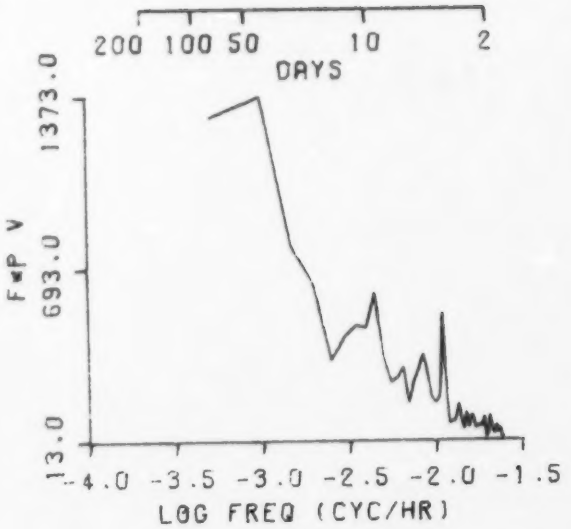


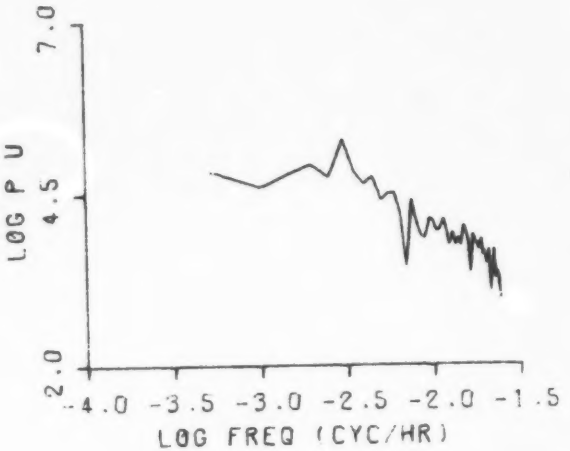


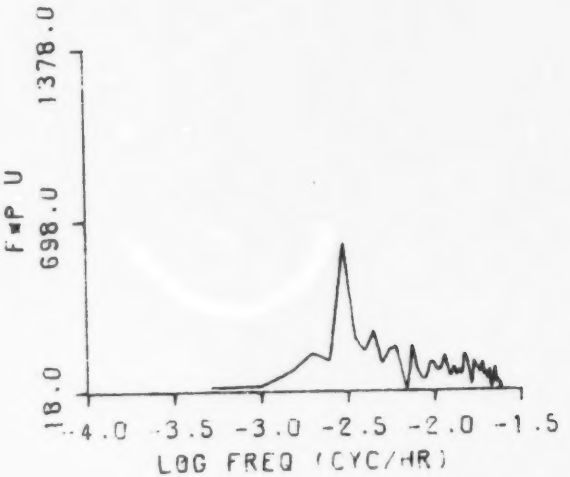

E03- 315 M 79/ 5/ 8/11 THETA = 38.0
200 100 50 10 2
DAYS
LOG P V
7.0
5.0
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
FxP V x 10'
239.80
122.35
4.90
LOG P U
FxP U x 10'
241.00
123.55
6.10

E03- 575 M 79/ 9/15/21 THETA = 36.0

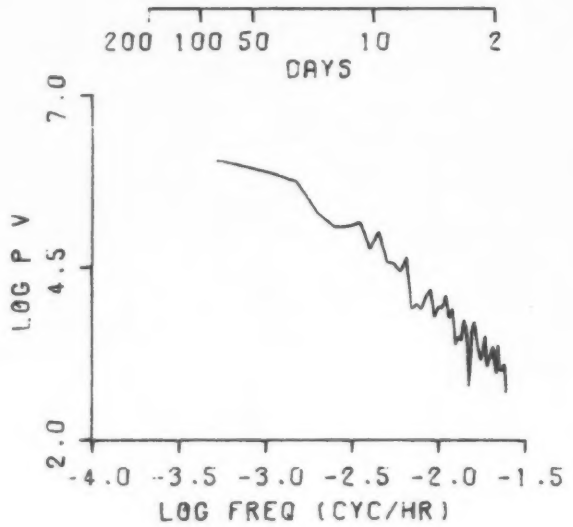


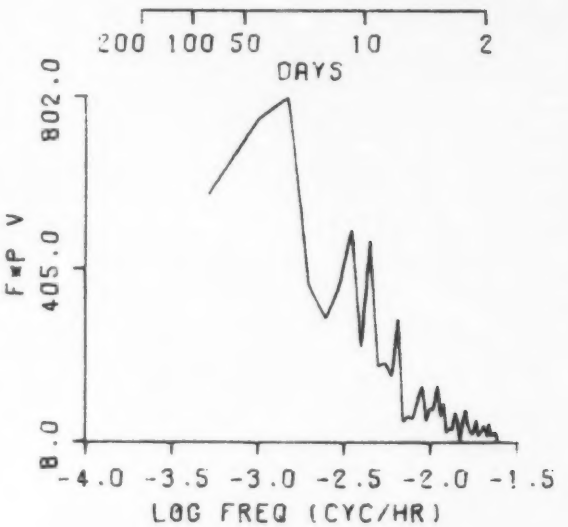


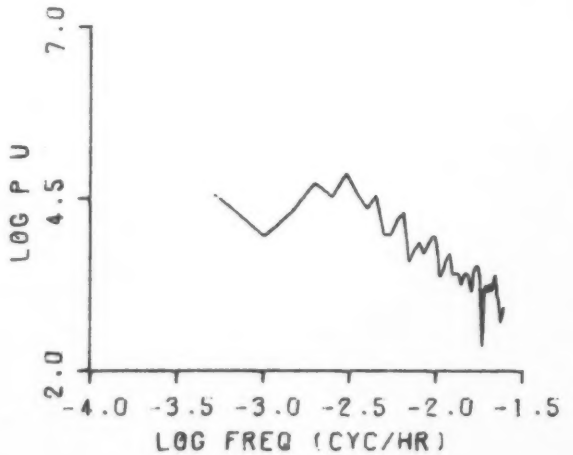


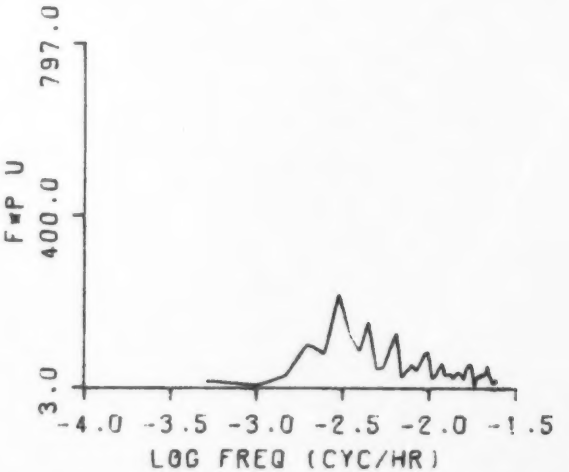


E03- 775 M 79/ 9/15/21 THETA = 35.0

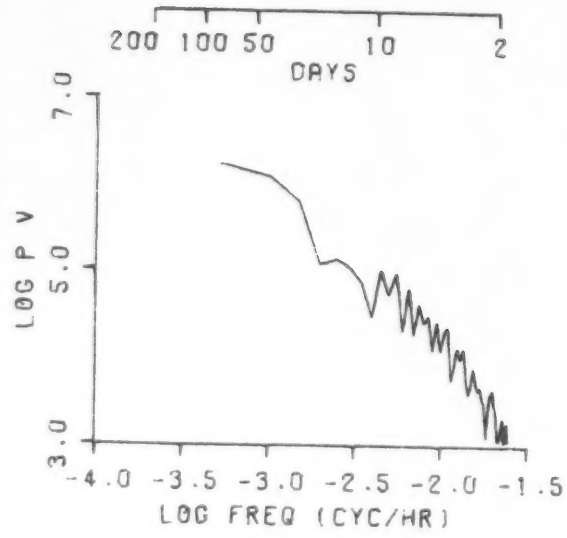


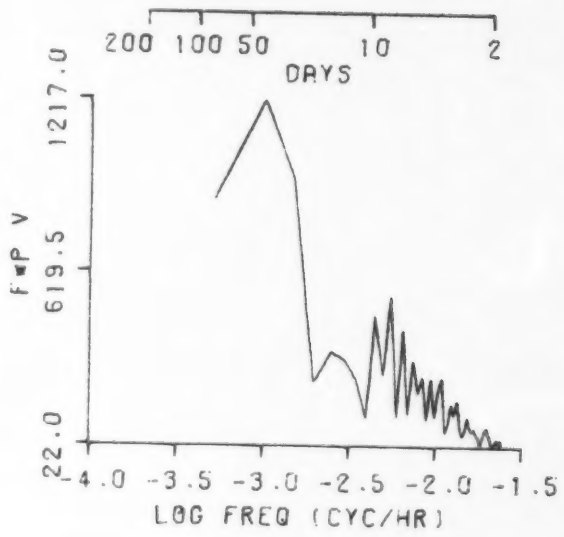


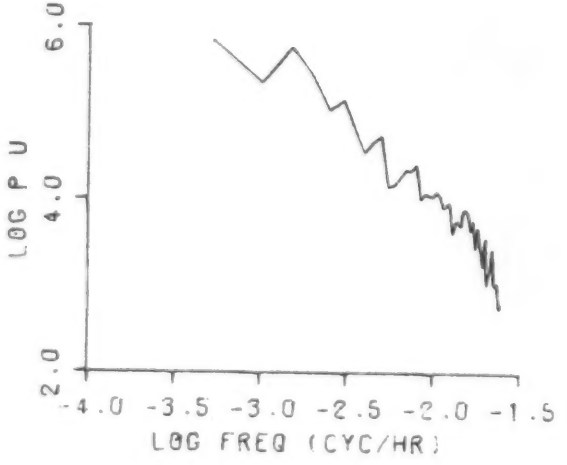


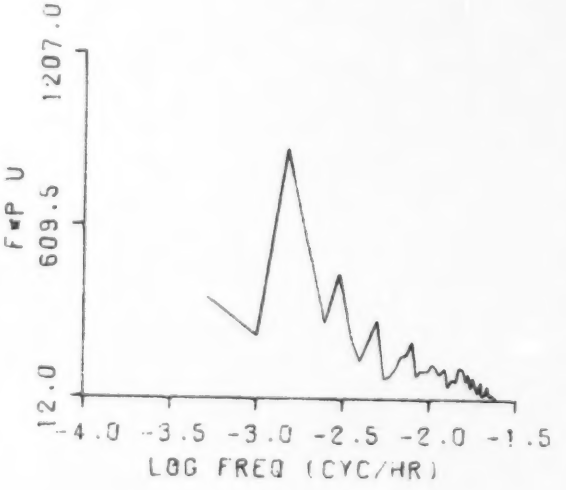


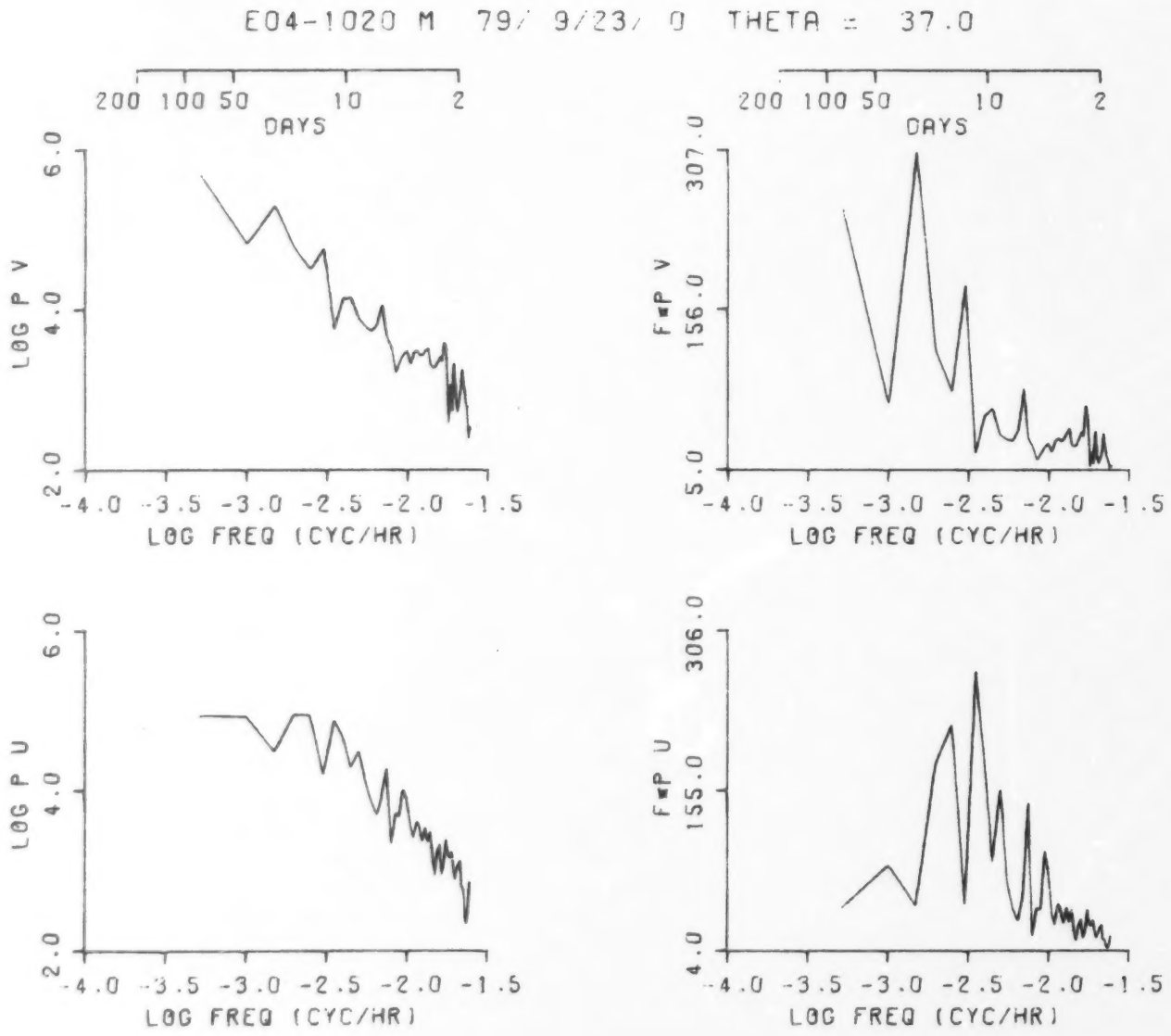
E04- 335 M 79/ 5/ 8/16 THETA = 57.0



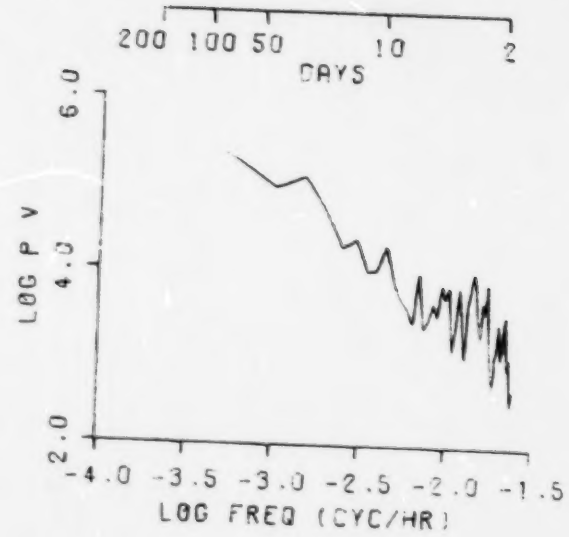


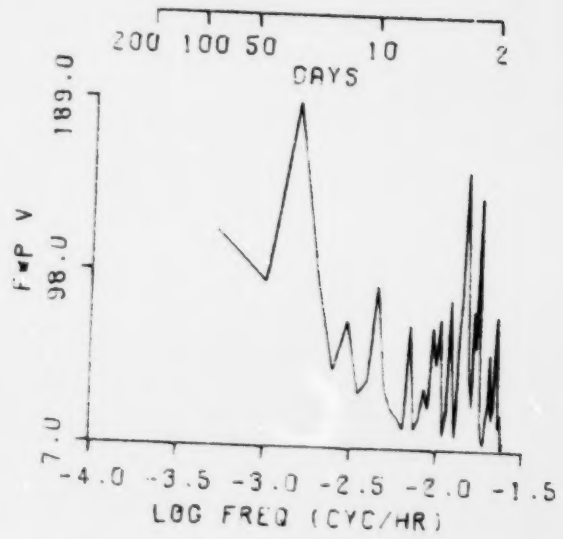


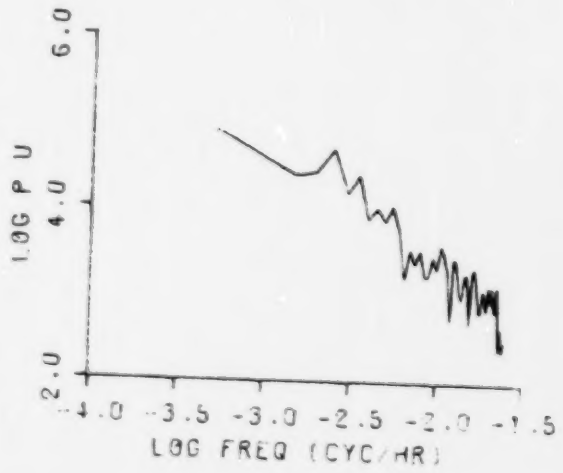


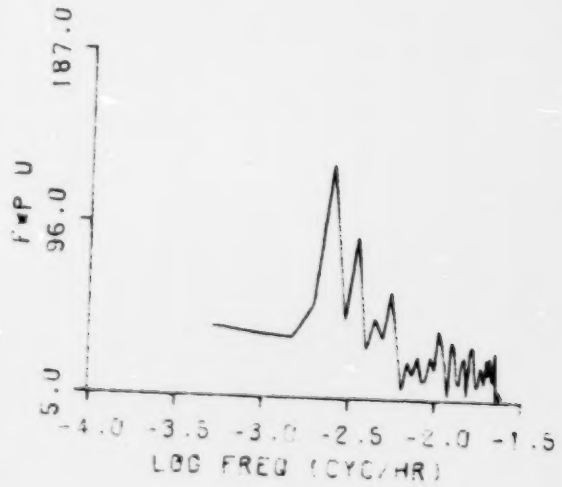

E04-1020 M 79/ 9/23/ 0 THETA = 37.0
200 100 50 10 2
DAYS
LOG P V
6.0
4.0
2.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V
307.0
156.0
5.0
LOG P U
F*P U
306.0
155.0
4.0

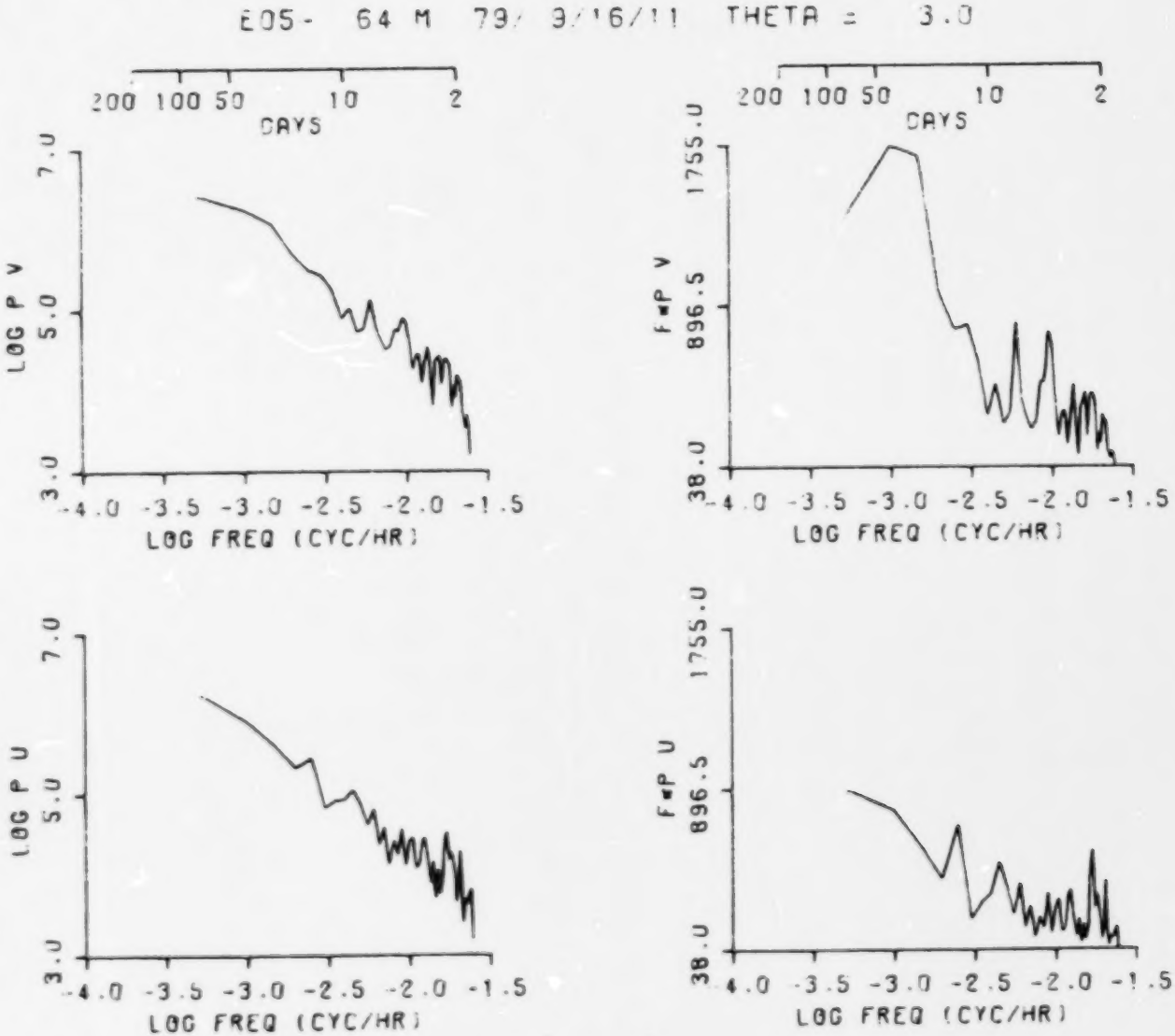
E04-1235 M 79/ 5/ 8/16 THETA = 46.0



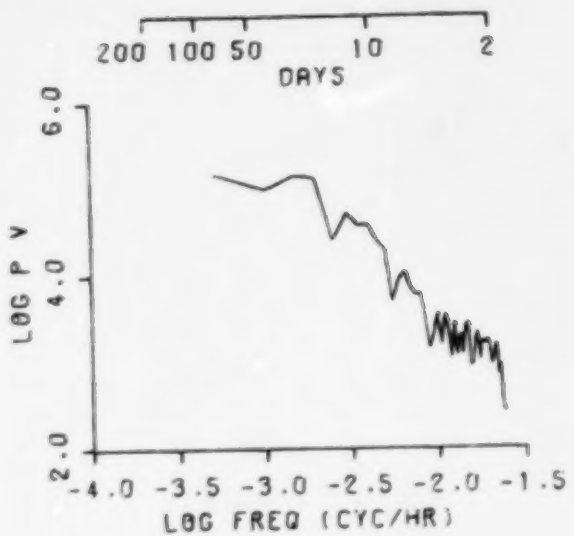


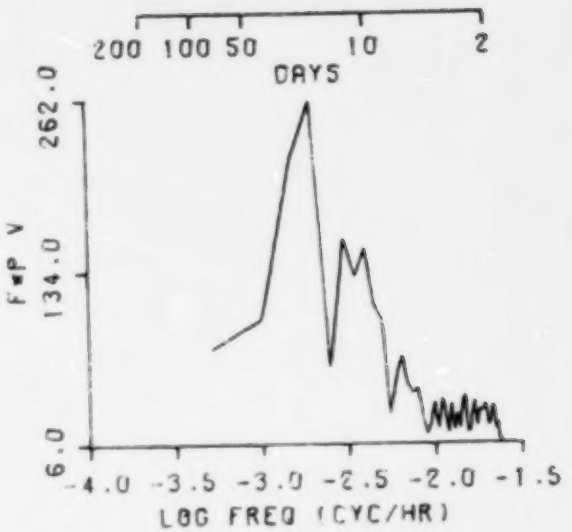


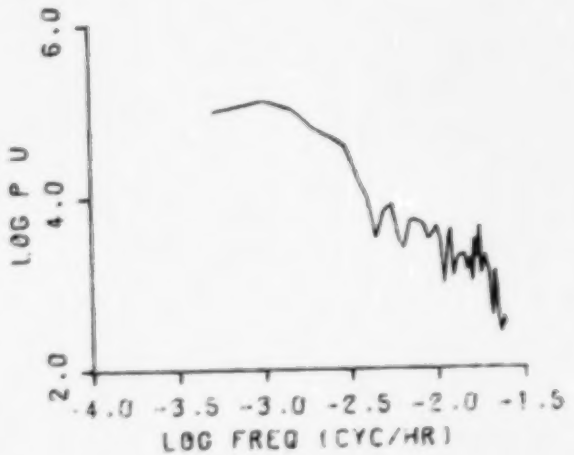


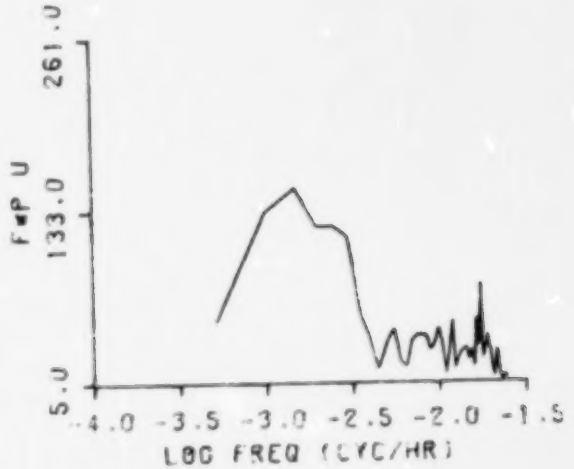

EOS- 64 M 79/ 3/16/11 THETA = 3.0
200 100 50 10 2
DAYS
LOG P V
7.0
5.0
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V
1755.0
896.5
38.0
LOG P U
F*P U

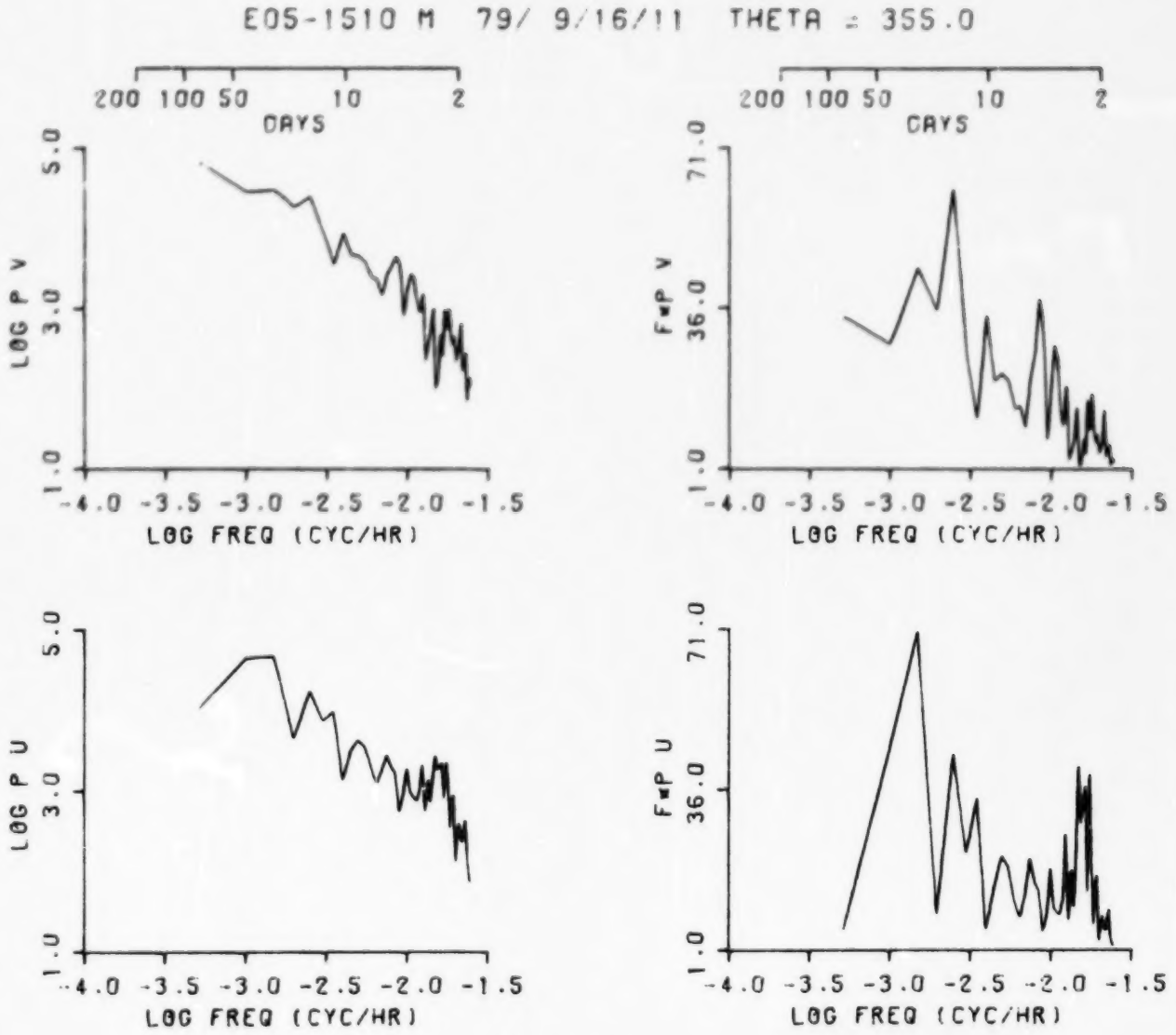
EOS- 950 M 79/ 5/ 9/14 THETA = 12.0



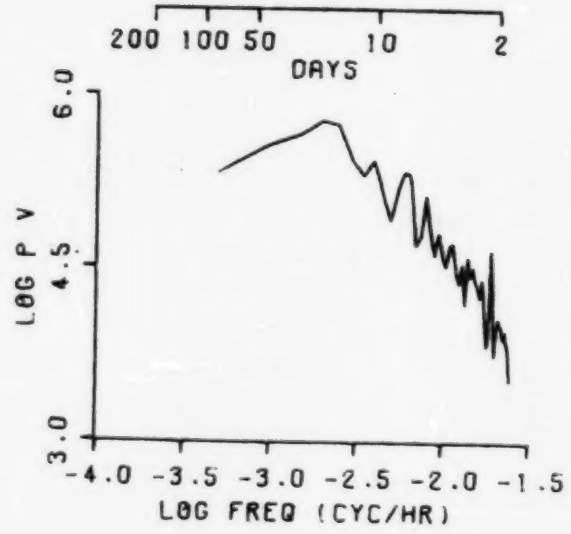


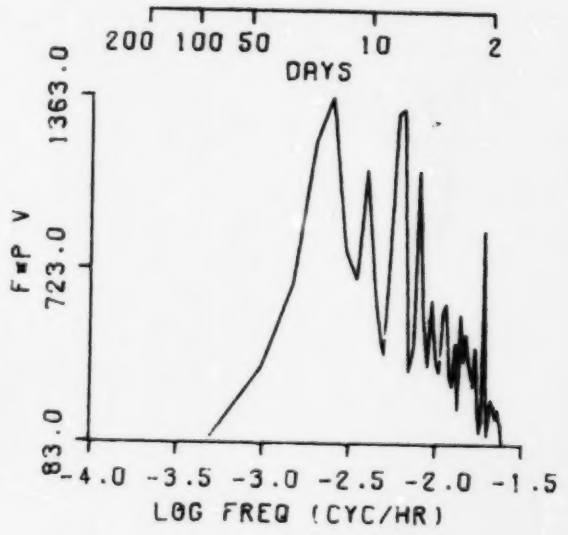


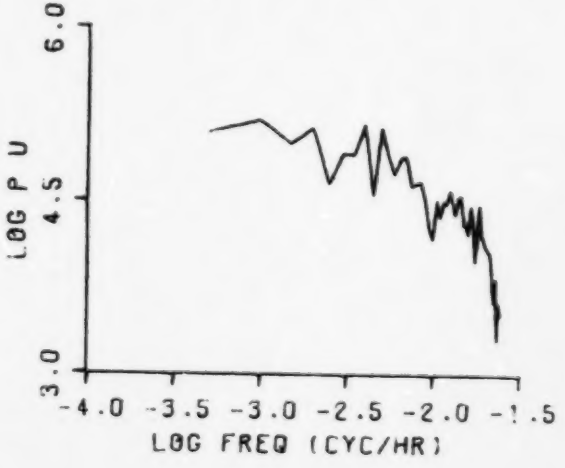


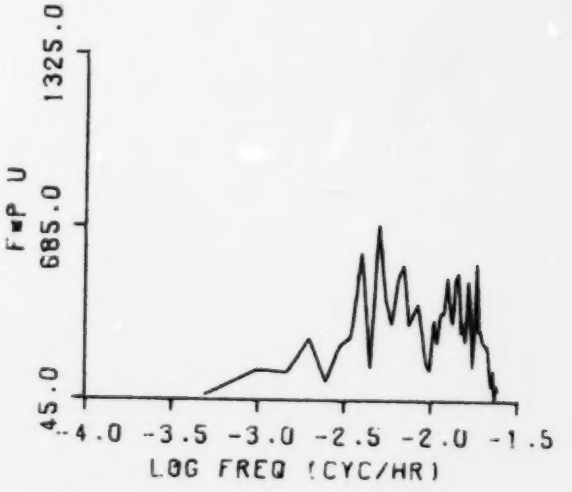

E05-1510 M 79/ 9/16/11 THETA = 355.0
200 100 50 10 2
DAYS
LOG P V
5.0
3.0
1.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
200 100 50 10 2
DAYS
F*P V
71.0
36.0
1.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
LOG P U
5.0
3.0
1.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P U
71.0
36.0
1.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)

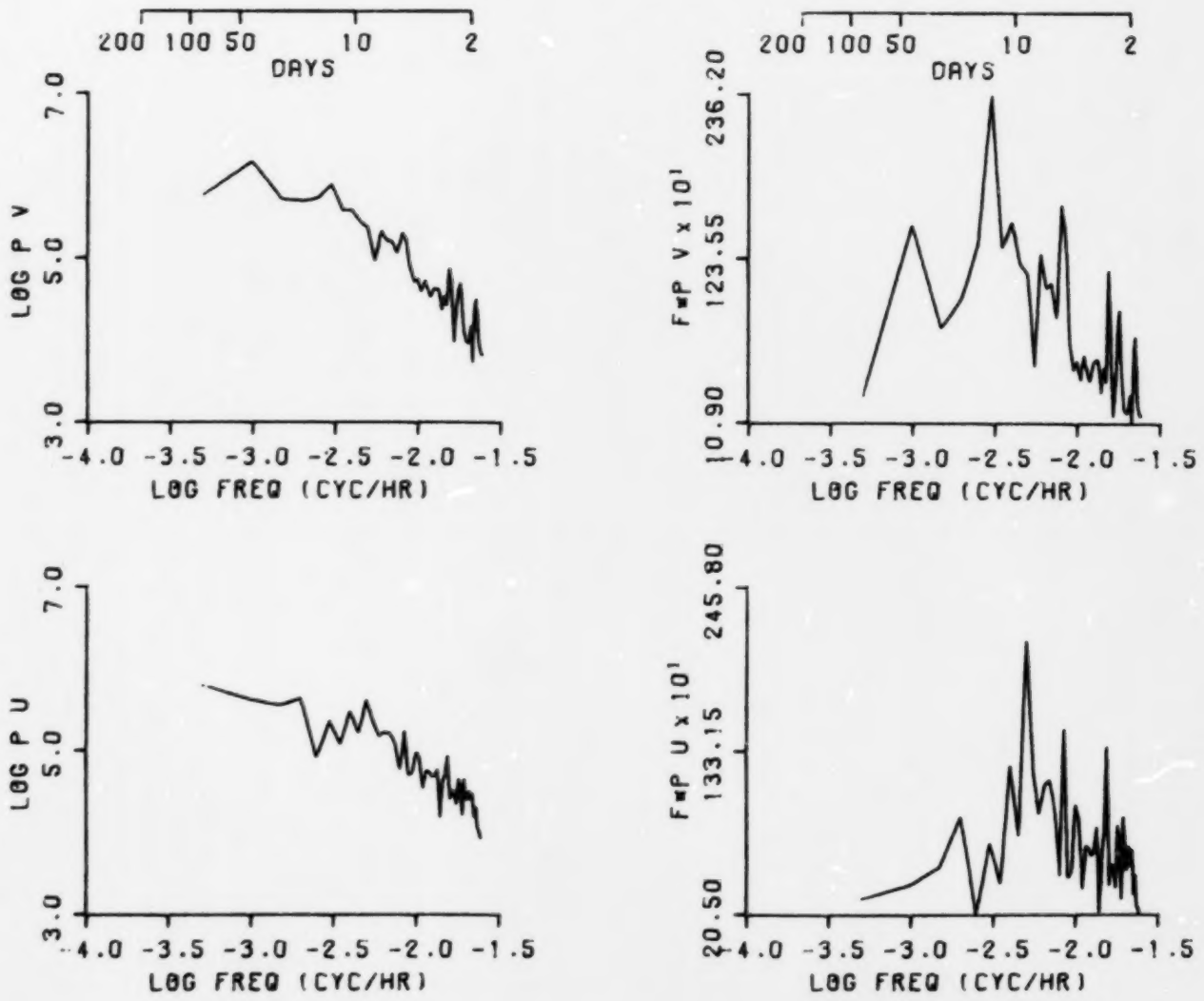
CZ1- 100 M 79/ 5/18/ 8 THETA = 290.0



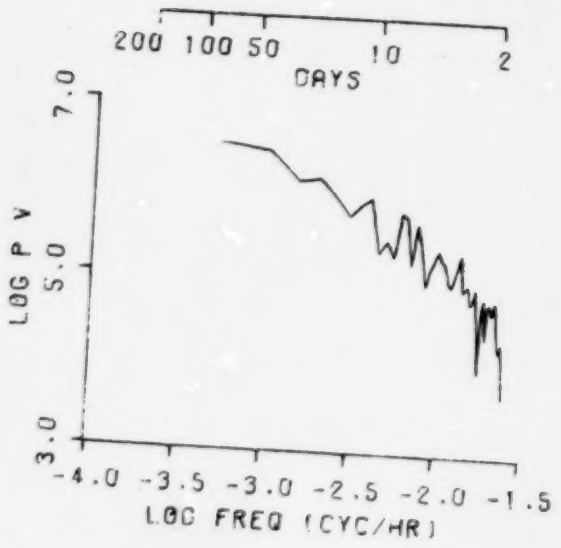


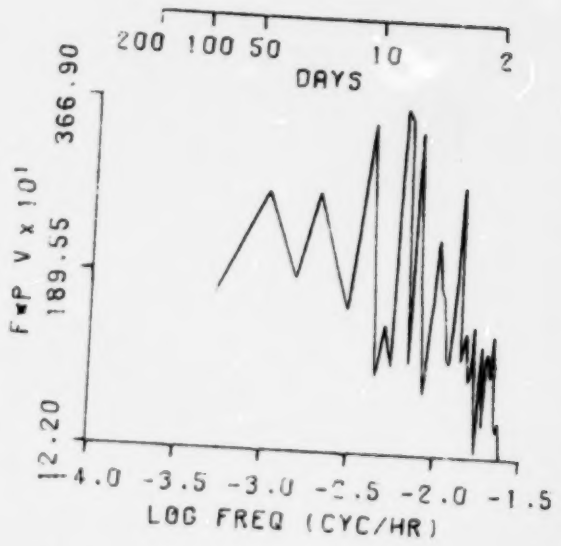


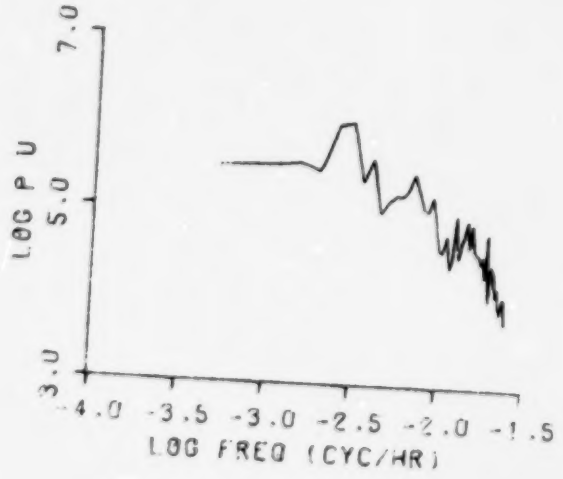


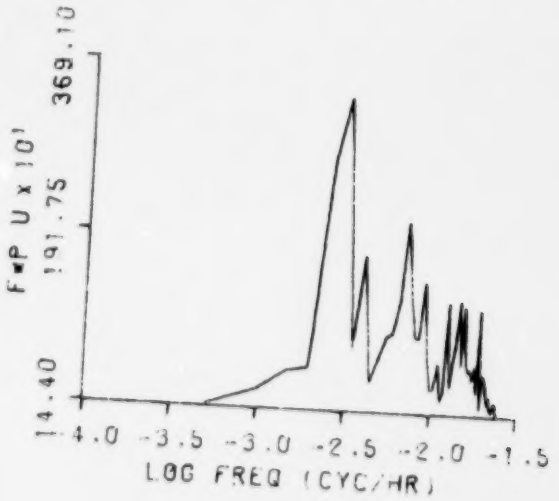

CZ1- 50 M 79/ 5/18/ 8 THETA = 275.0
200 100 50 10 2
DAYS
LOG P V
7.0
5.0
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V x 10¹
236.20
123.55
10.90
LOG P U
F*P U x 10¹
245.80
133.15
20.50

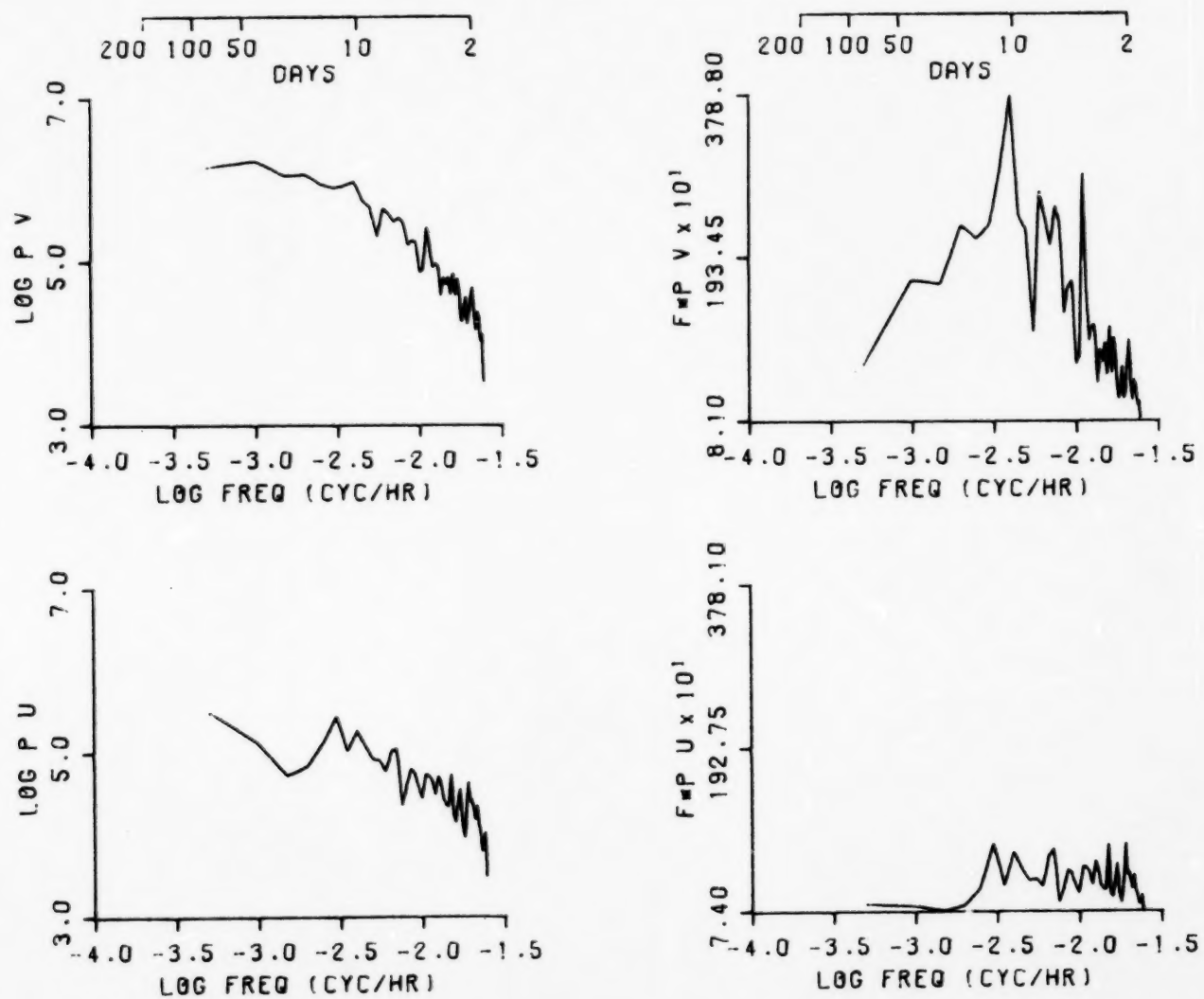
CZ2- 50 M 79/11/27/15 THETA = 53.0



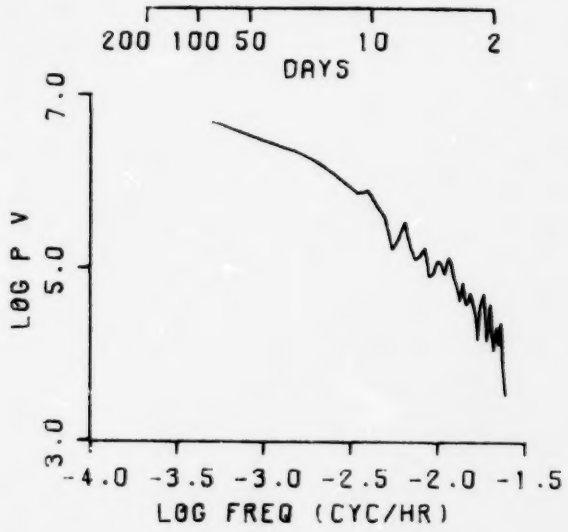


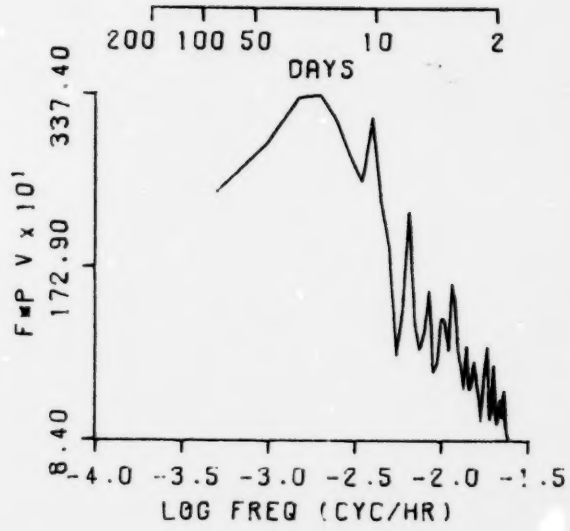


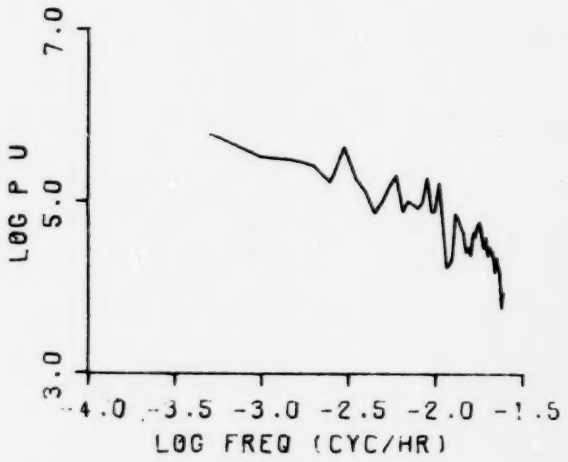


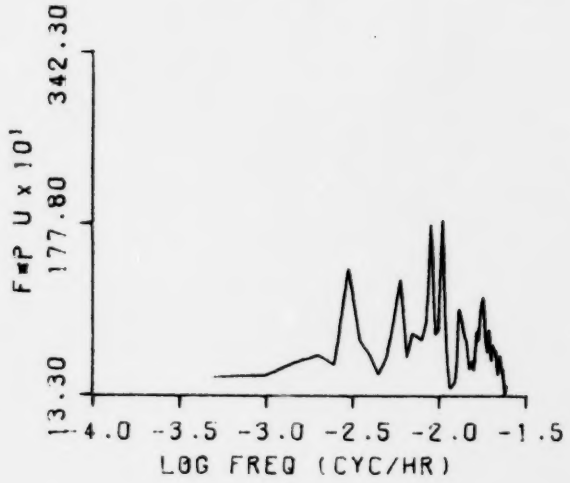

CZ2- 100 M 79/ 5/18/11 THETA = 70.0
200 100 50 10 2
DAYS
LOG P V
7.0
5.0
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V x 10^1
378.80
193.45
8.10
LOG P U
F*P U x 10^1
378.10
192.75
7.40

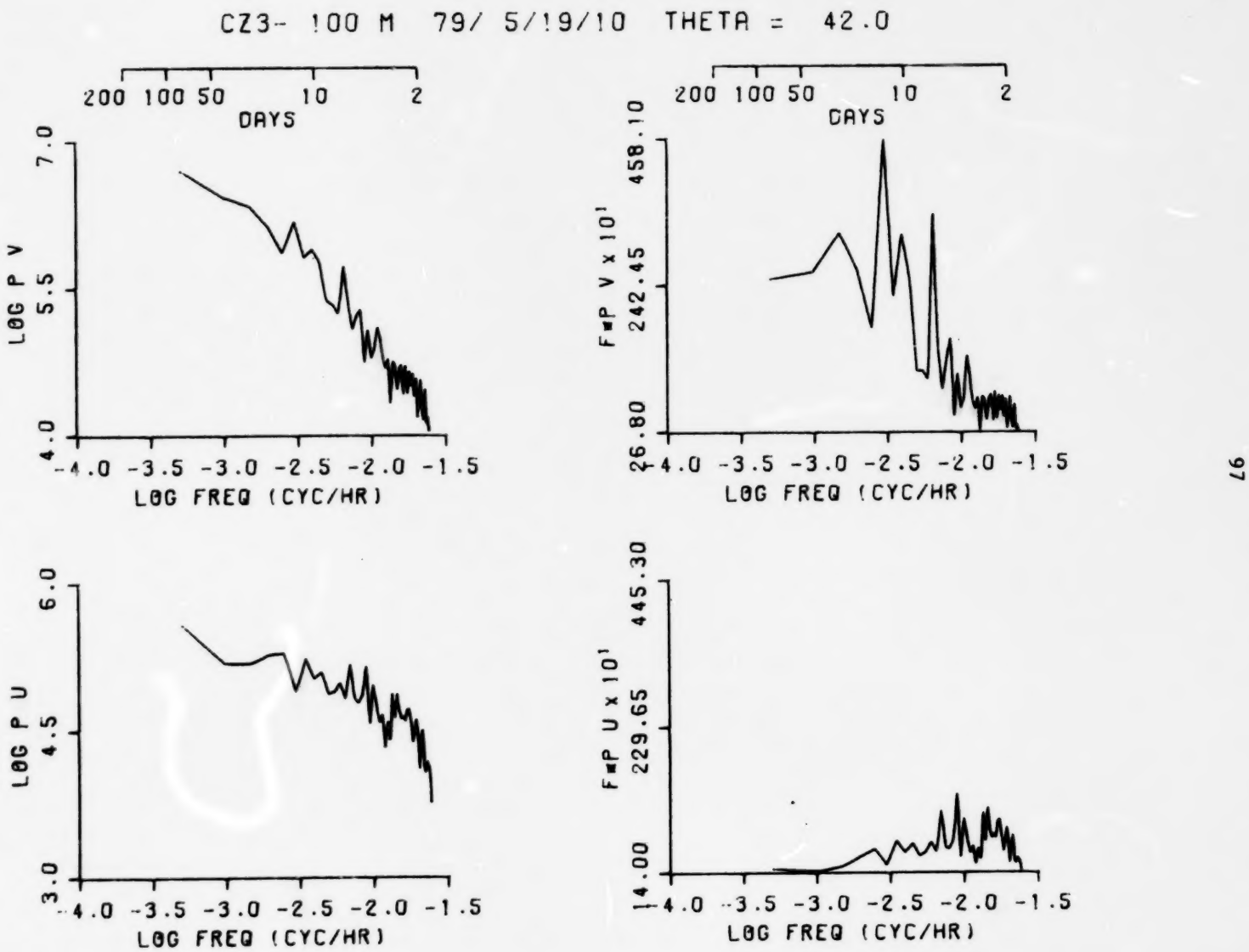
CZ3- 50 M 79/ 5/19/10 THETA = 46.0



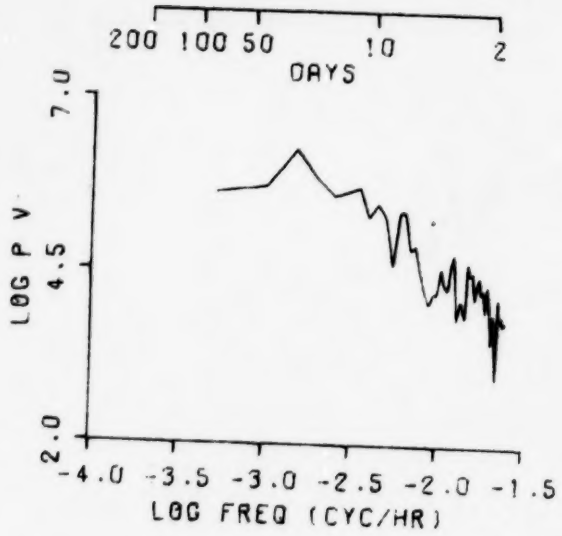


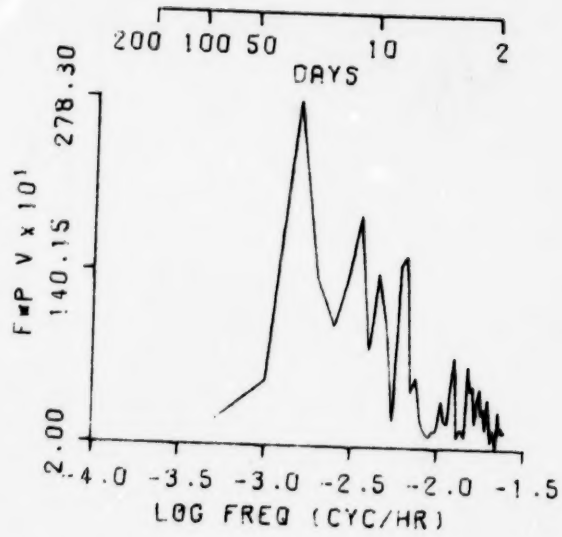


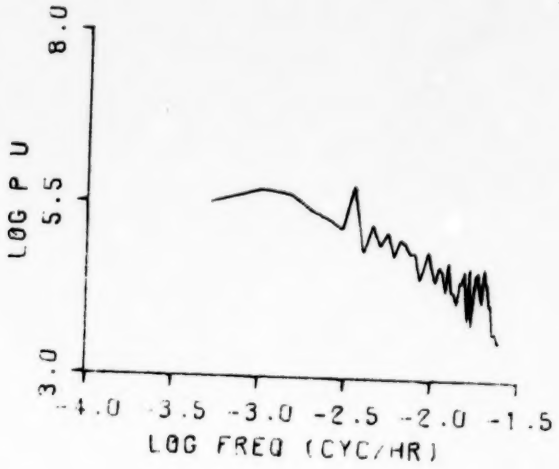


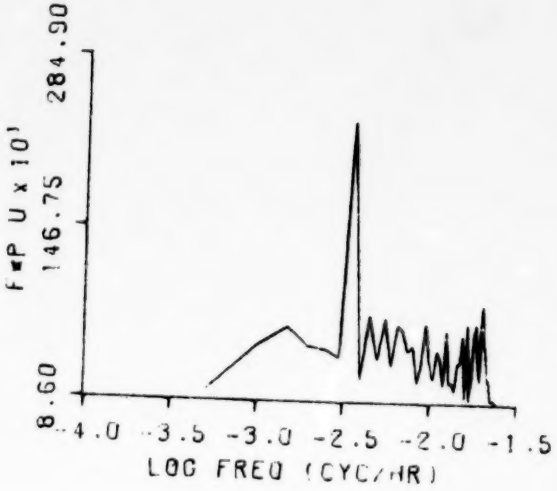

CZ3- 100 M 79/ 5/19/10 THETA = 42.0
200 100 50 10 2
DAYS
LOG P V
7.0
5.5
4.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V x 10¹
458.10
242.45
26.80
LOG P U
6.0
4.5
3.0
F*P U x 10¹
445.30
229.65
14.00

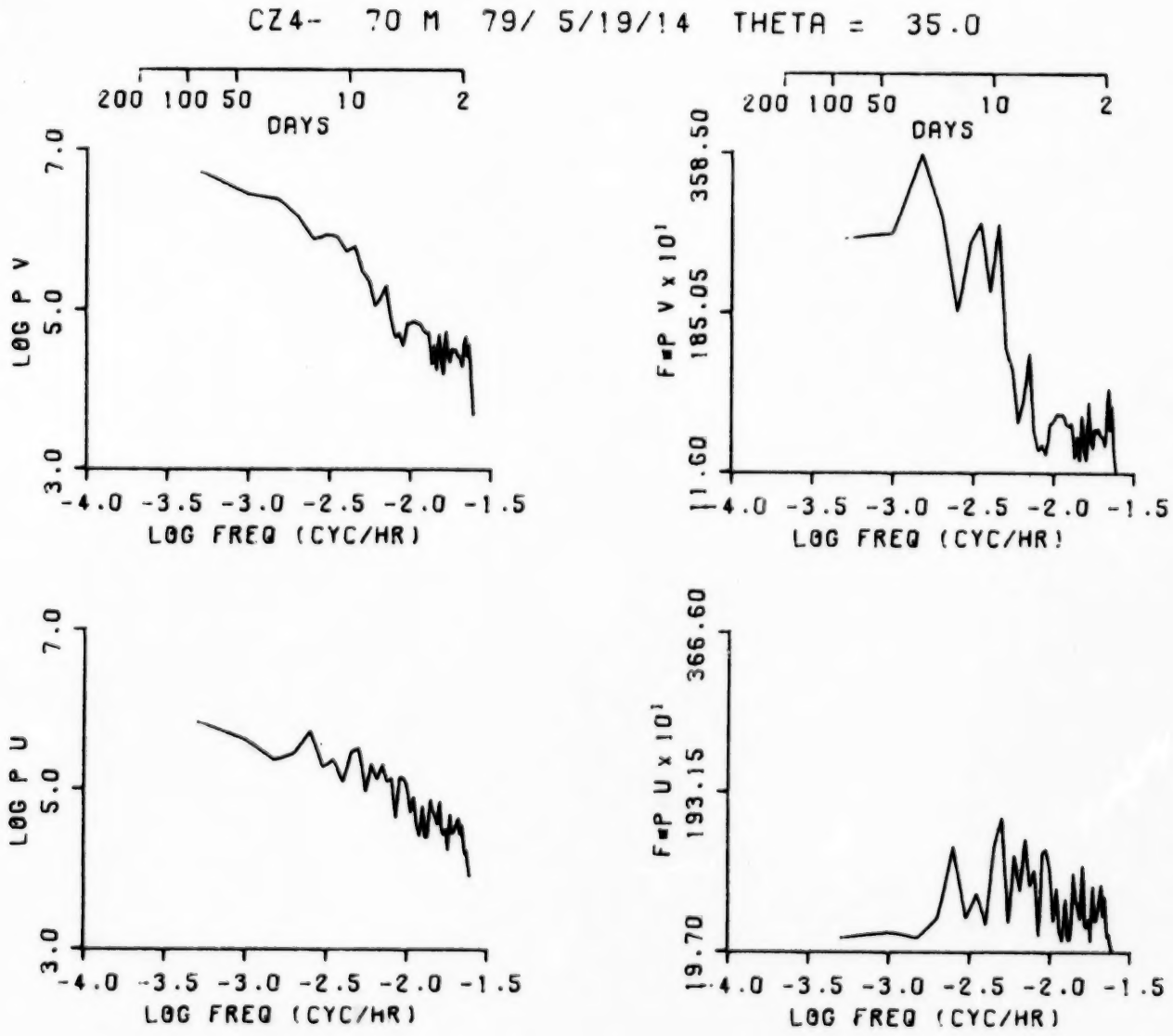
CZ3- 200 M 80/ 6/11/14 THETA = 58.0



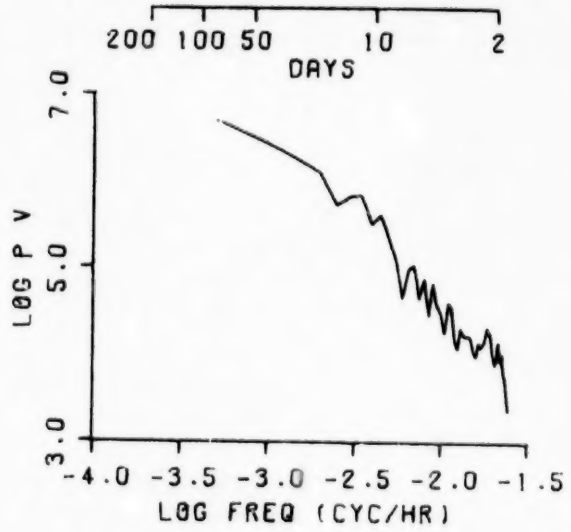


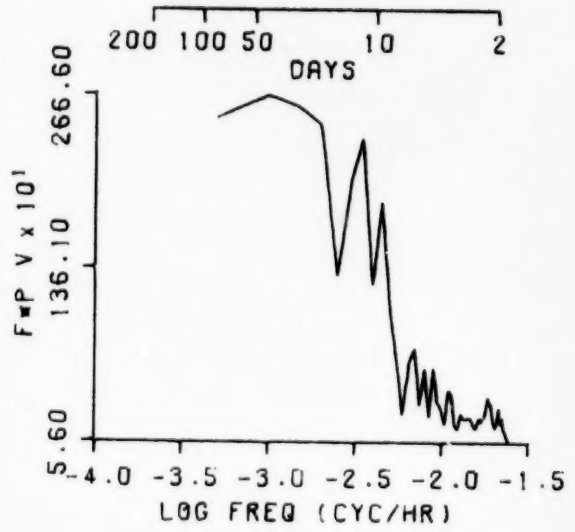


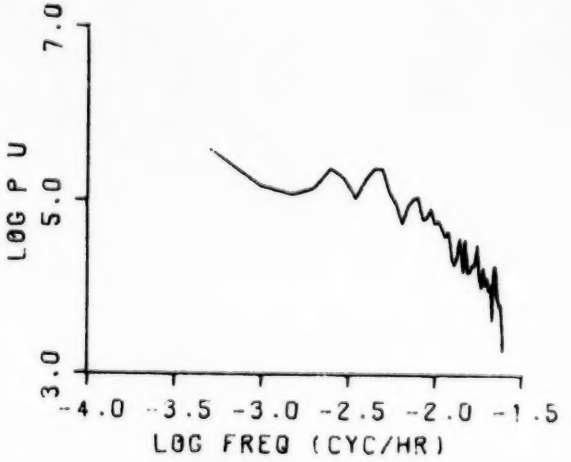


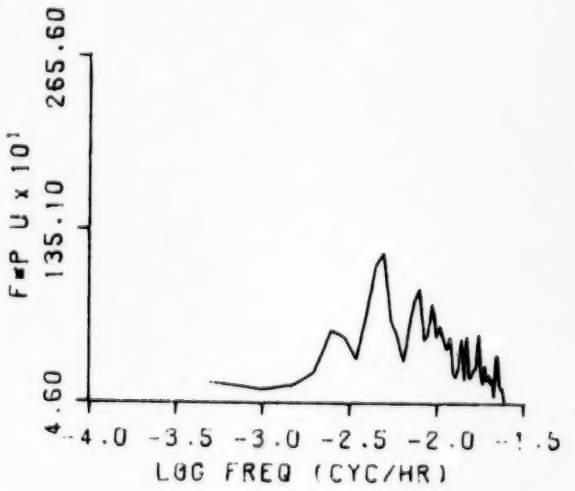

CZ4- 70 M 79/ 5/19/14 THETA = 35.0
200 100 50 10 2
DAYS
LOG P V
7.0
5.0
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
FxP V x 10¹
358.50
185.05
11.60
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
LOG P U
7.0
5.0
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
FxP U x 10¹
366.60
193.15
19.70
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)

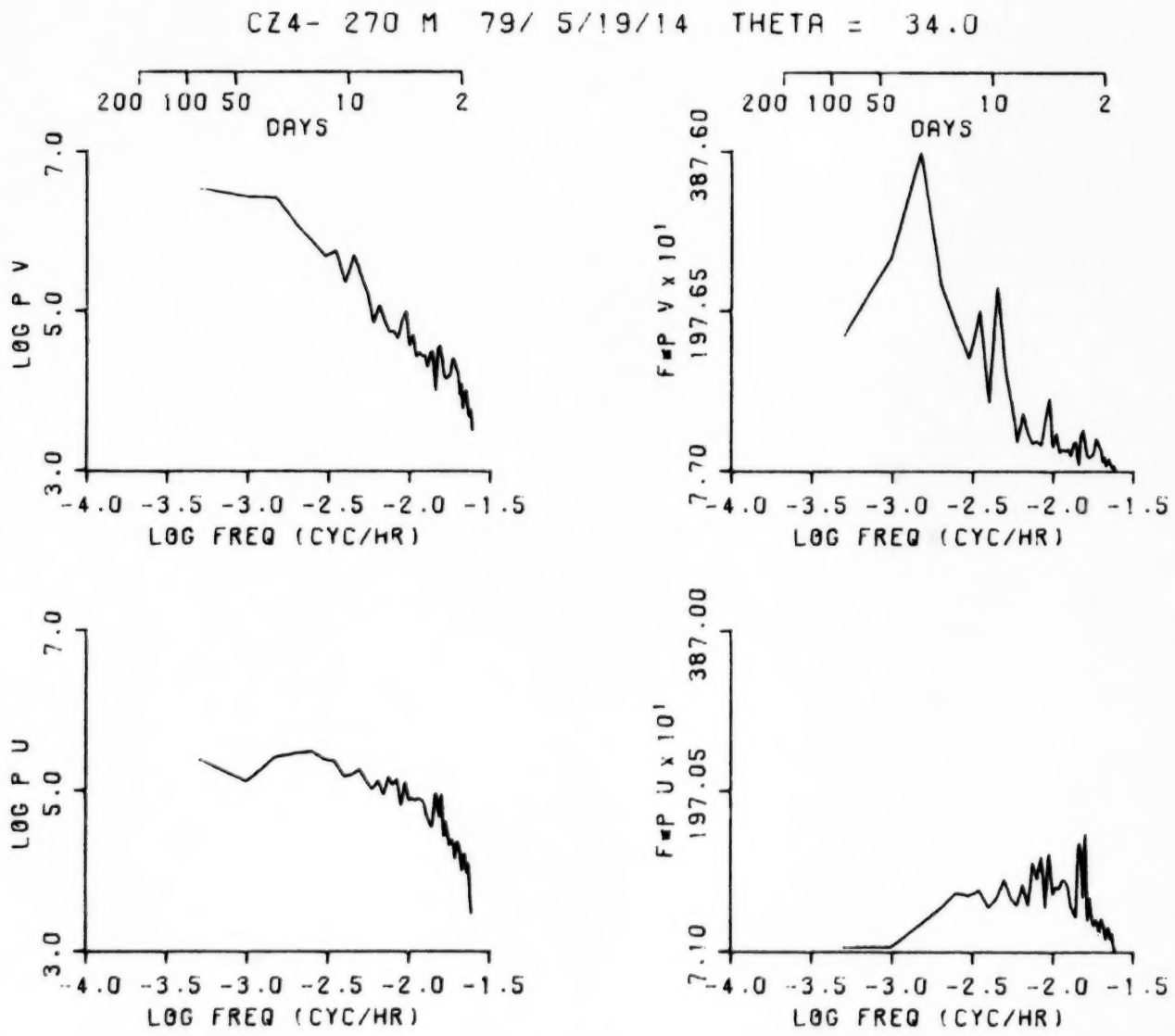
CZ4- 120 M 79/ 5/19/14 THETA = 39.0

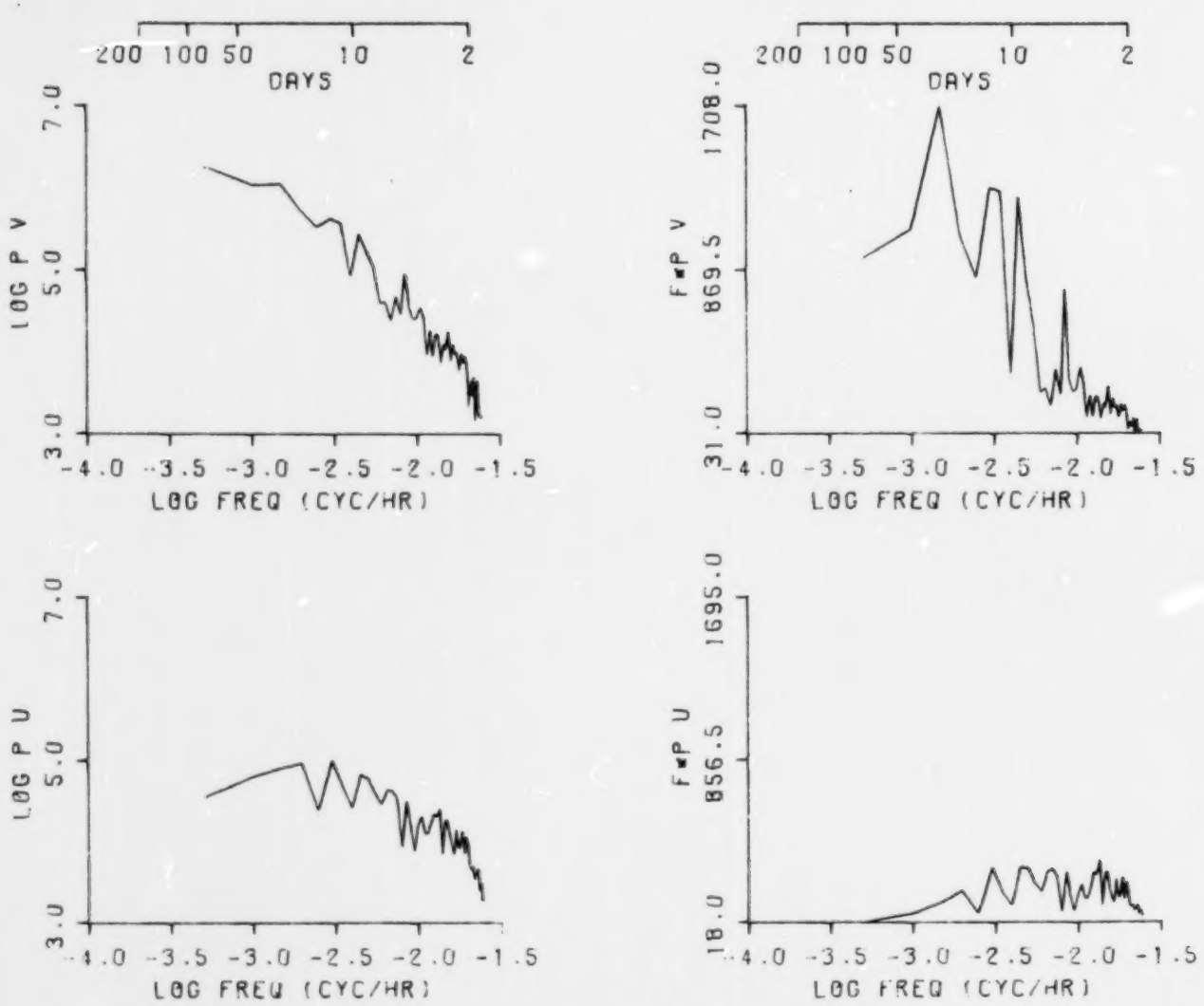









CZ4- 270 M 79/ 5/19/14 THETA = 34.0
200 100 50 10 2
DAYS
LOG P V
7.0
5.0
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V x 10¹
387.60
197.65
7.70
LOG P U
F*P U x 10¹
387.00
197.05
7.10


CZ4- 500 M 79/10/10/15 THETA = 42.0
200 100 50 10 2
DAYS
LOG P V
7.0
5.0
3.0
-4.0 -3.5 -3.0 -2.5 -2.0 -1.5
LOG FREQ (CYC/HR)
F*P V
1708.0
869.5
31.0
LOG P U
856.5
18.0
F*P U
1695.0